- Northwest increases fine paper capacity
- Pipe, fittings, pumps and valves in groundwood pulping
- Vinyl resin adhesives
- ACS symposium on wood hemicelluloses

The Paper Industry

Publishers of PAPER AND PULP MILL CATALOGUE

Northwest Paper Company
Brainerd, Minn. See page 538.

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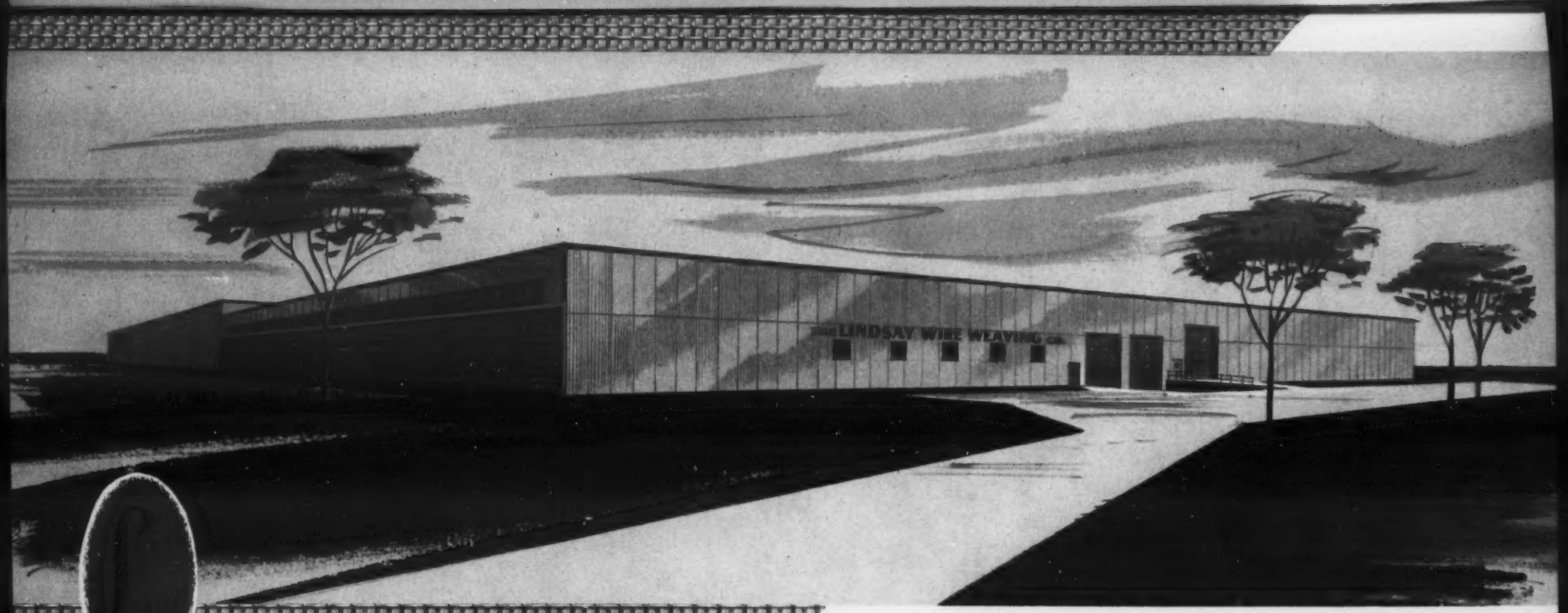


NEW MENTOR PLANT...

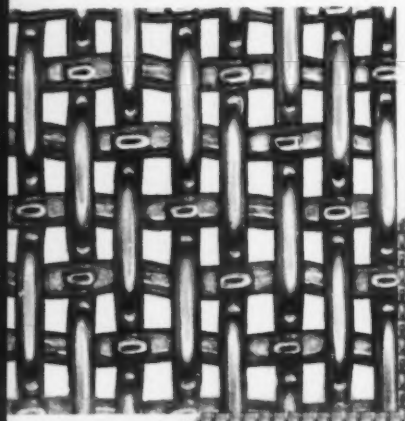
another evidence of Lindsay's Resolve to expand service as the Paper Industry Grows

Enlarging capacity by more than 25%, the new Lindsay plant in Mentor, Ohio, strides with a notable progress—the progress recorded by the paper-making industry during the past five decades. The photographs herein suggest how all the steps in the Lindsay operation are tied together in one over-all program to insure uniformity and quality. This is true of both research and manufacturing —from strand wire processing and testing through weaving, seaming, finishing, inspection and packaging.

A third modern plant, in Mentor, further implements Lindsay's fixed policy of manufacturing Longcrimp Fourdrinier wire cloth uniform in quality

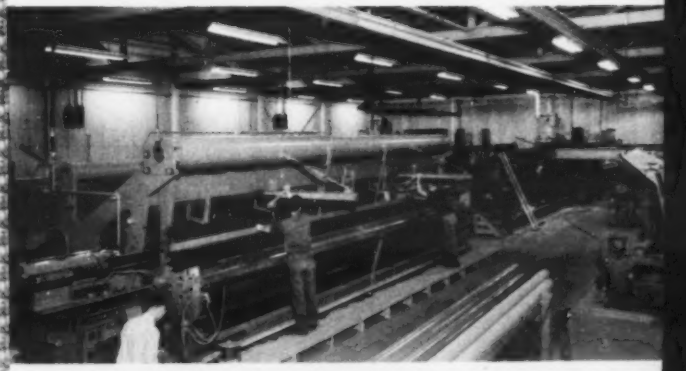
Finishing, aided by ample room for maneuvering and handling, is just one of a sequence of critical operations marked by extreme care.

This partial view of one loom area includes a section of the Mentor machine shop, where loom parts are fabricated to Lindsay's own design.



Seen above is the Lindsay-designed Longcrimp Fourdrinier wire cloth, which is widely used in the manufacture of paper.

On these modern, high speed looms is woven Fourdrinier wire cloth in a wide range of meshes and in widths from 150 to 350 inches.



Three additional high speed, automatically controlled looms in various stages of construction. Foreground: a 306" loom nears completion.

"Since 1903"

THE LINDSAY WIRE WEAVING COMPANY

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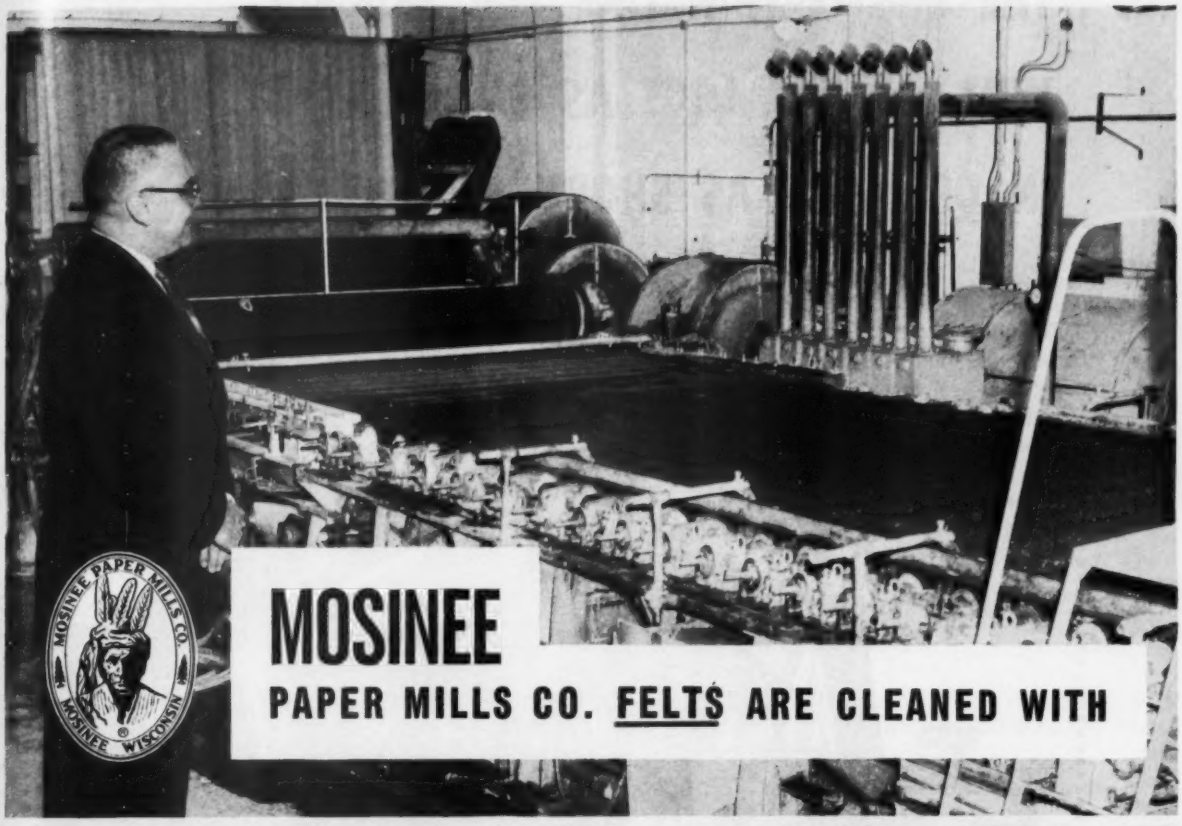

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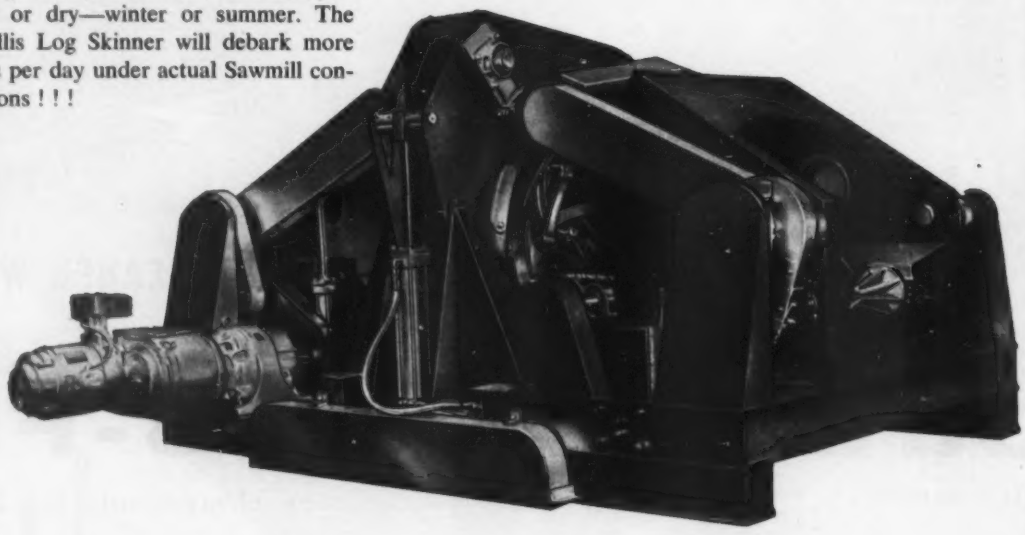

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Features . . .

Editorial — Paper-plastics combination spell increased paper sales 525

Northwest increases fine paper capacity 538
by A. W. J. Dyck

Adhesives in the paper industry: Part VII 545

Penobscot installs new one-half million dollar wet end 547

The use of pipe, fittings, pumps and valves in the pulp and paper industry: Part X 548
by Roland L. Allen Jr.

Felt running size—its effect on board finish and production 550
by David Mc Conaughy

Symposia of the Division of Cellulose Chemistry of the American Chemical Society 552
by Louis E. Wise

Falls Paper & Power wins Fritz Trophy second straight year 555

Operate the "60's" — without blood — without tears 559

U. S. group impressed after visiting Finnish paper mills 573

Recent expansions in the industry 574

Chicago welcomes new corrugated box plant 579

Whither? — Airborne pulp dryer — Consistorator, a new consistency regulator — Cost of nuclear vs. conventional fuels — Effects of surfactants on drainage and strength of sulfite pulps — Titanium in the pulp and paper industry 610

News . . .

News of the Industry 573
Names in the News 585
Necrology 587

Departments . . .

Current Comments 569
Coming Events 581
Foreign Abstracts 588
Patent Reviews 592
New Products 595
New Literature 603
Market Quotations 607
Index to Advertisers 609

The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number.

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From our point of view..

Paper-plastics combinations spell increased paper sales

There is not likely to be a serious upset of the paper-products market due to the incursion of plastics products into applications that traditionally belong to paper. On the contrary, paper-plastics combinations offer a tremendous opportunity to the paper industry, so that their overall effect will result in an increase rather than a decrease of paper applications and sales.

As pointed out at the 14th Plastics-Paper Conference held in Chicago on September 20-23, the main areas of plastic films penetration into the paper market have been in bread wrappings and plastic bags. Even if these areas were completely dominated by plastics, it would only affect 1 per cent of the market now held by paper products.

The best known material in paper-plastics combinations is wax. It enjoys the most advantageous quality-cost relationship, although the gap here is being closed rapidly by the startling incursion of synthetic plastics — notably polyethylene. M. W. Kane of KVP estimates that paper and paperboard currently are using 1,050,000 lb. of wax per annum and that by 1965 this figure will increase to 1,250,000 lbs. The increase, according to Kane, will be solely due to increased usage of waxed paperboard. In terms of dollars this consumption of wax would amount to $60 to $70 million in 1959 and $80 million in 1965.

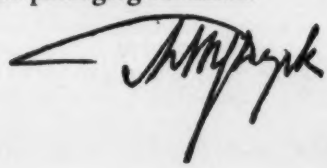
The main advantages held by wax are of course that (1) its use is more economical than that of any other material, (2) it has a low melting point, and (3) it performs well on the packaging machines at speeds commensurate with modern high-productivity requirements.

The consumption of polyethylene, wax's chief competitor in the coated paper field, is expected to rise to 65 to 75 million pounds by 1962 in extrusion coating applications on various types of substrates, according to E. H. Meyers of Monsanto. This does not include the 5 to 8 million pounds of linear polyethylene which also are expected to find their way into the extrusion coating field.

In 1957, paper and paperboard used 57 per cent of all the polyethylene used in extrusion coating. This figure is expected to rise to 63 per cent by 1962, with most of the increase due to rapidly rising demands for polyethylene coated paperboard.

The largest single end-use market for polyethylene extrusion-coated products is the multiwall bag field, where in 1957 some five million pounds of polyethylene were used. Among large potential markets for polyethylene coated paper products, Meyers listed (1) the milk carton field where some 70 to 80 million pounds of polyethylene could be used annually, (2) the corrugated container field which could use 15 to 25 million pounds of polyethylene, (3) frozen food packaging with an estimated requirement of 10 to 15 million pounds of polyethylene, and (4) fresh meat packaging which could absorb 6.5 million pounds of this material.

While polyethylene coated paperboard already is being enthusiastically accepted by the packaging industry, its most spectacular growth, according to Meyers, will take place with the development of a suitable adhesive which would permit better performance on high-speed packaging machines.



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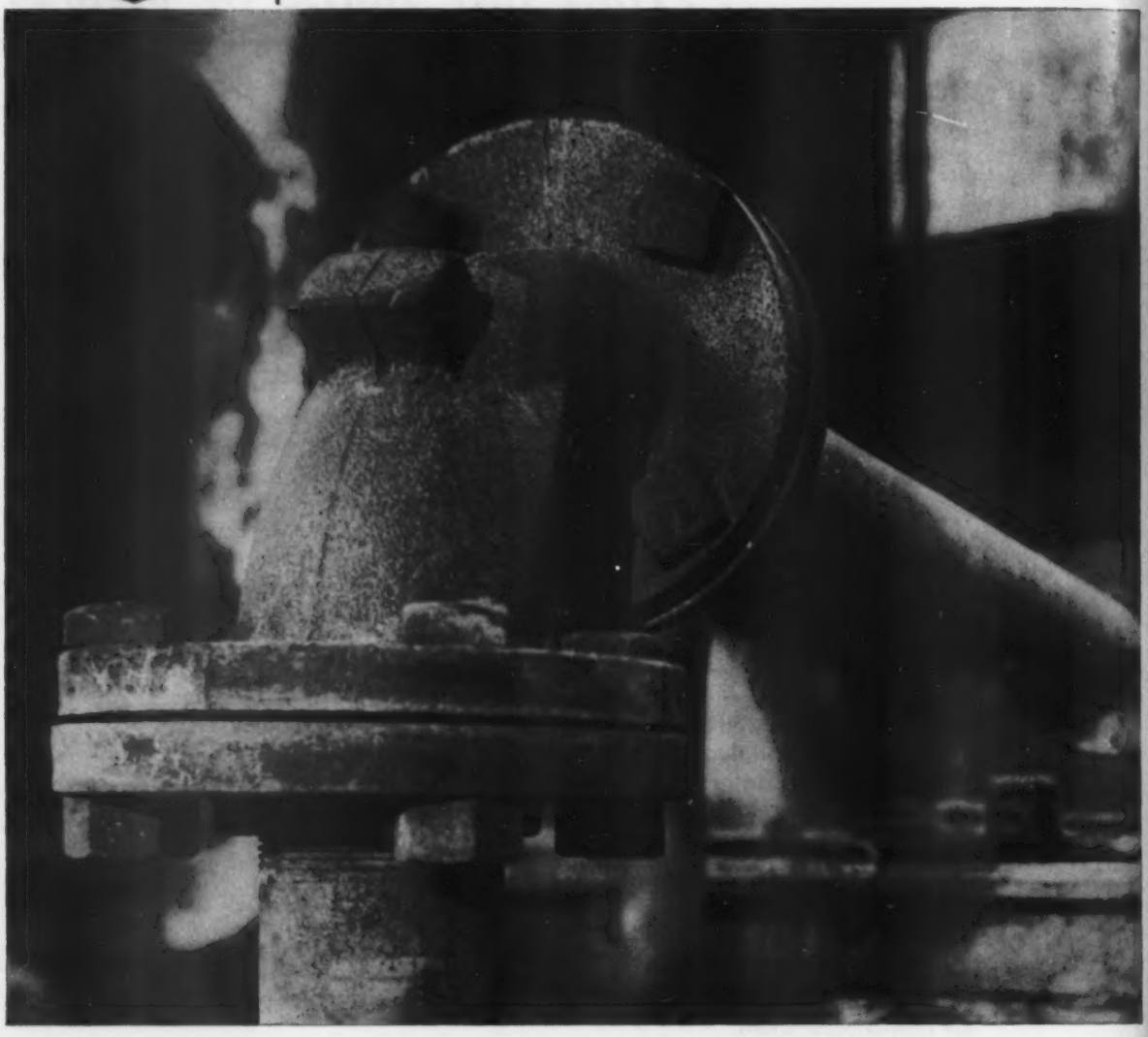

Saran Lined Pipe carries 140°F. Sulphuric Acid . . . resists shock, temperature changes, corrosion

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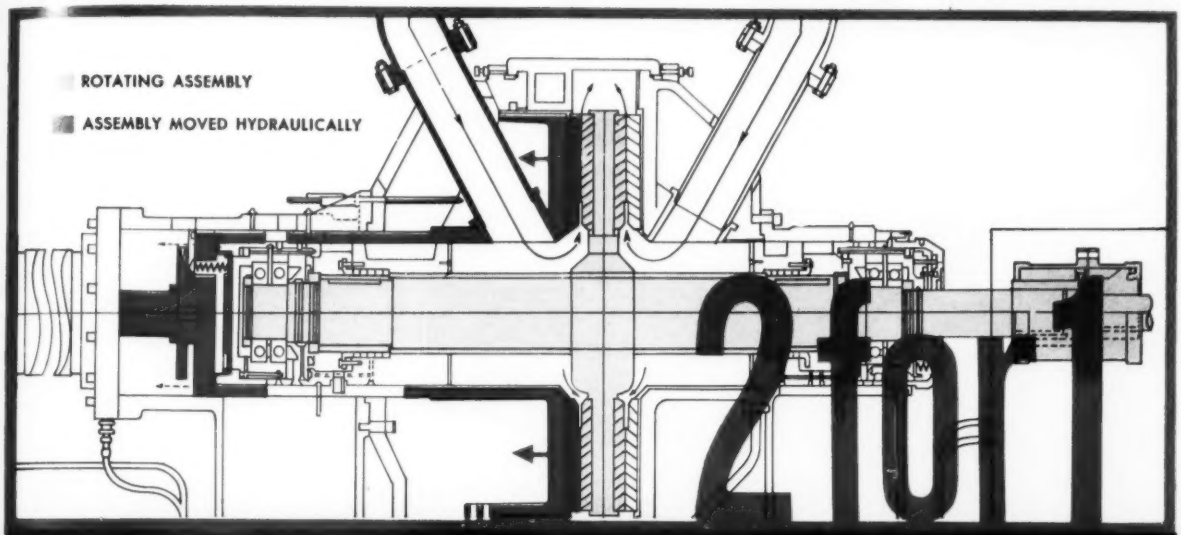

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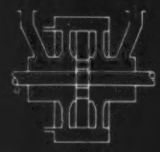

This new type stock preparation refiner offers superior quality control, low operating costs and simplified maintenance. The parallel feed arrangement serves twin refining surfaces, giving twice the capacity of standard single disc units. The key to refining accuracy and dependability is the floating rotor shaft disc assembly which rotates between the fixed and hydraulically controlled movable heads. The flow of pulp is equally distributed to both sets of plates, assuring uniform refining and even plate wear. Major advantages are: mechanical simplicity; high production; uniform quality; plus low operating and maintenance cost.

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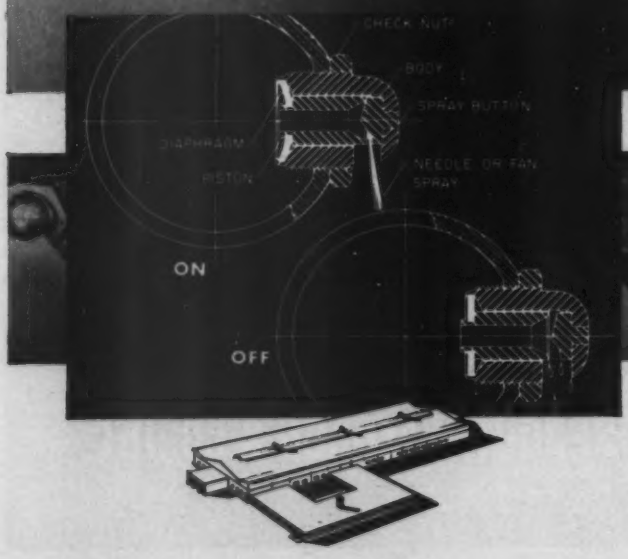

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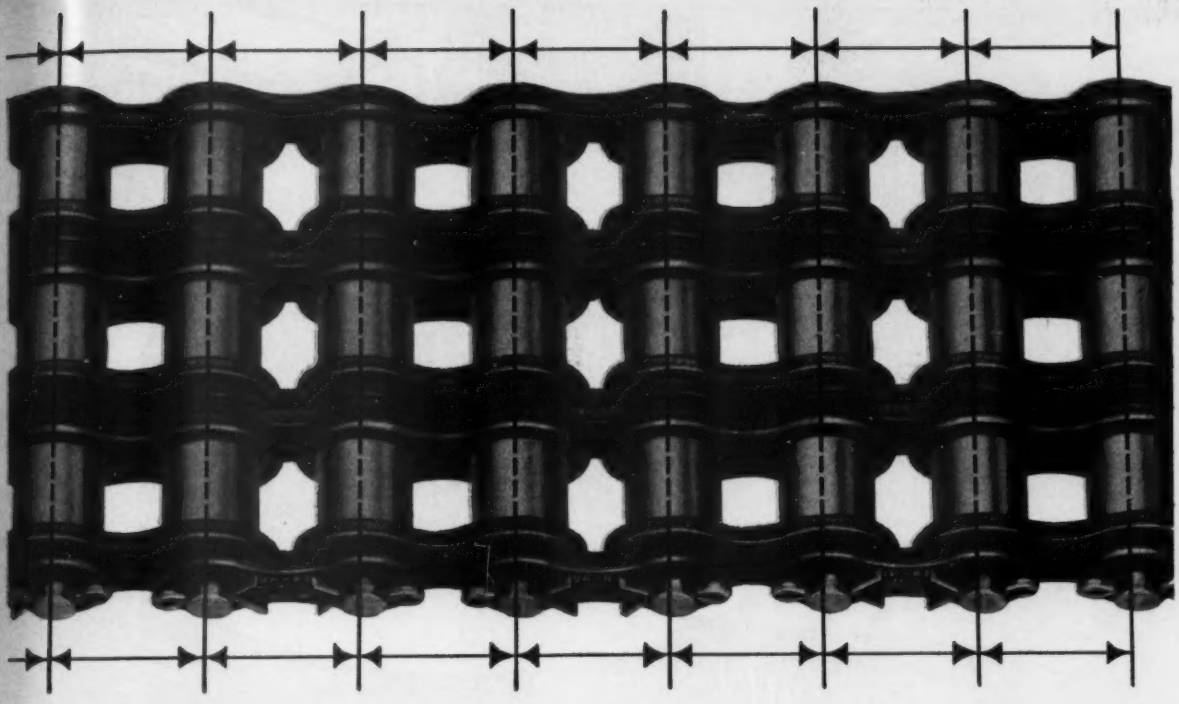

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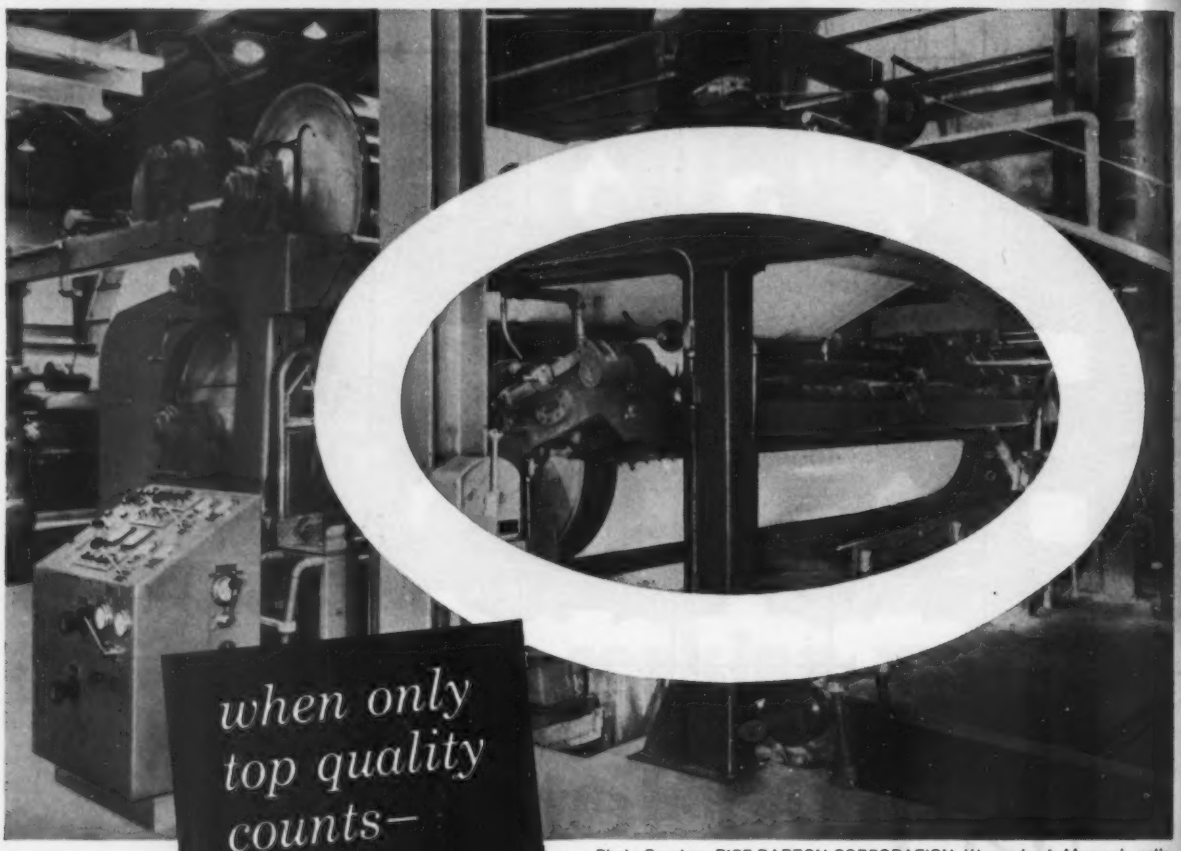

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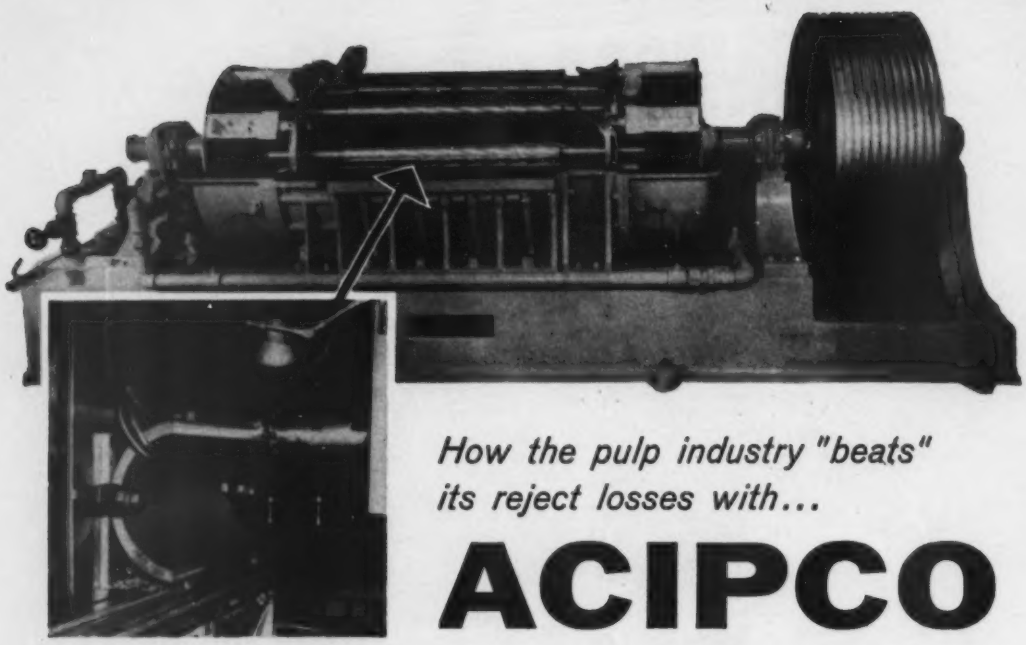

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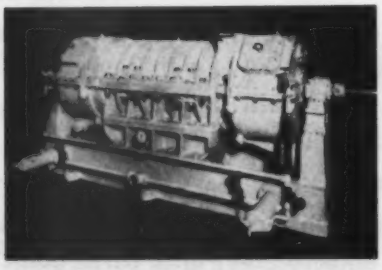

Reject recovery with Anton J. Haug refiners is saving paper mills more than $7 million per year in wood alone! ACIPCO *furnishes tough, durable, stainless steel liners which go inside the main casings of the machines.*

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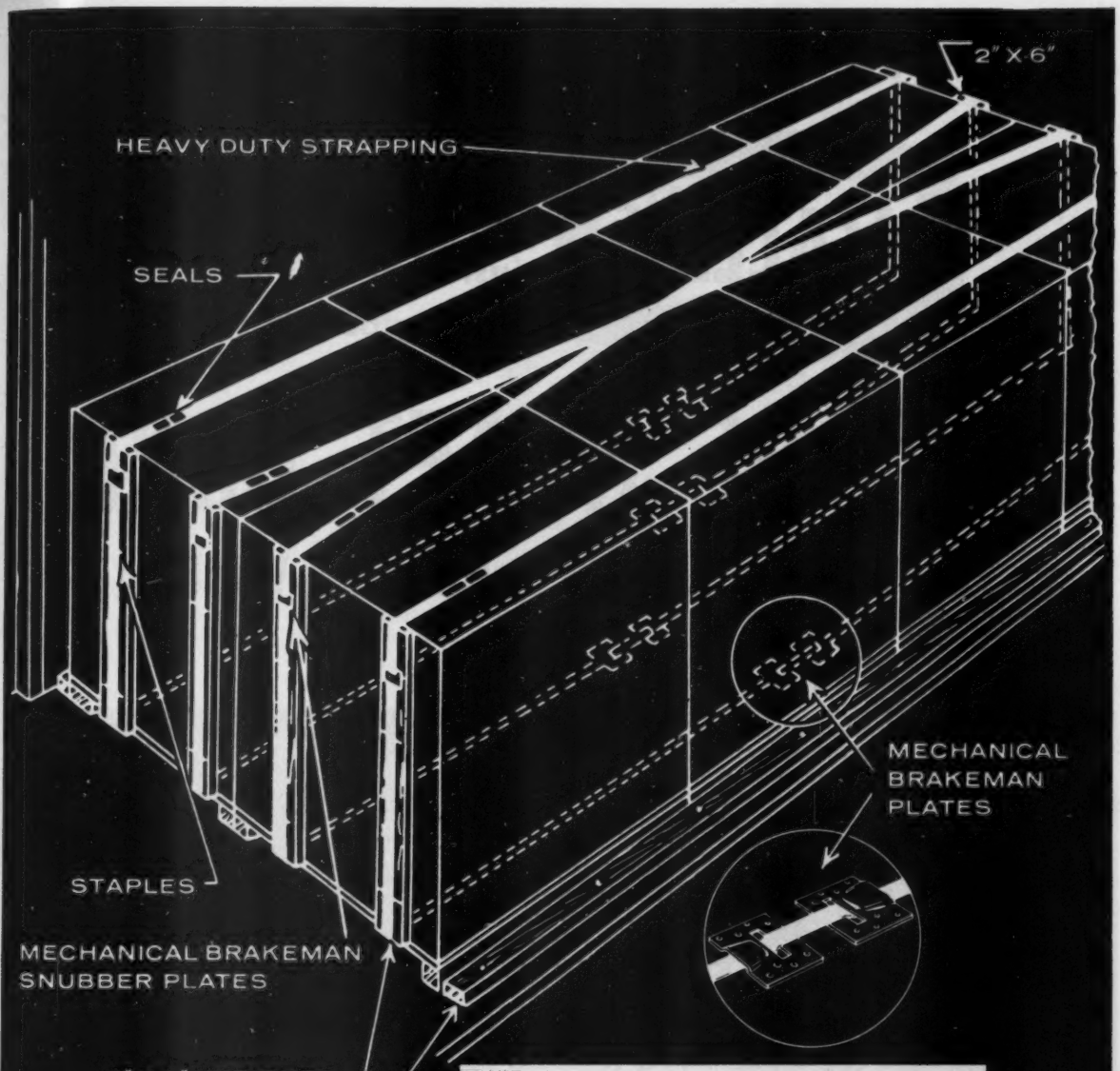

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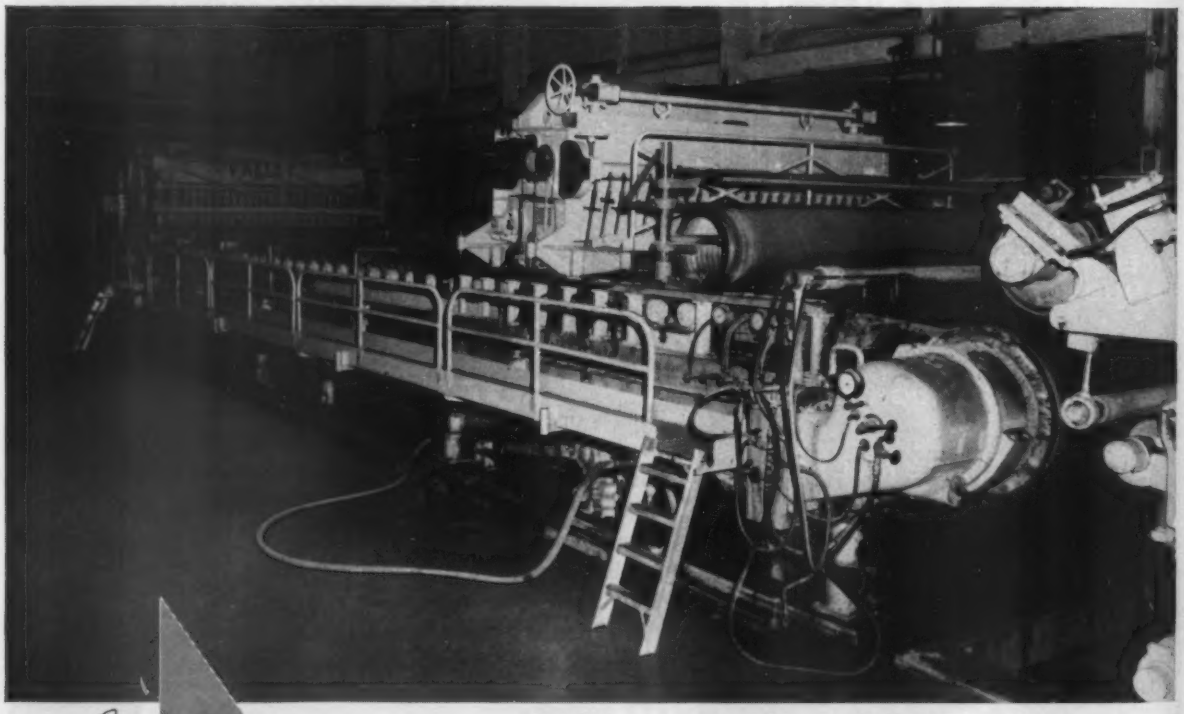
Hugo Trygg,
Mill Manager



Consult . . .

VALLEY IRON WORKS CORP.

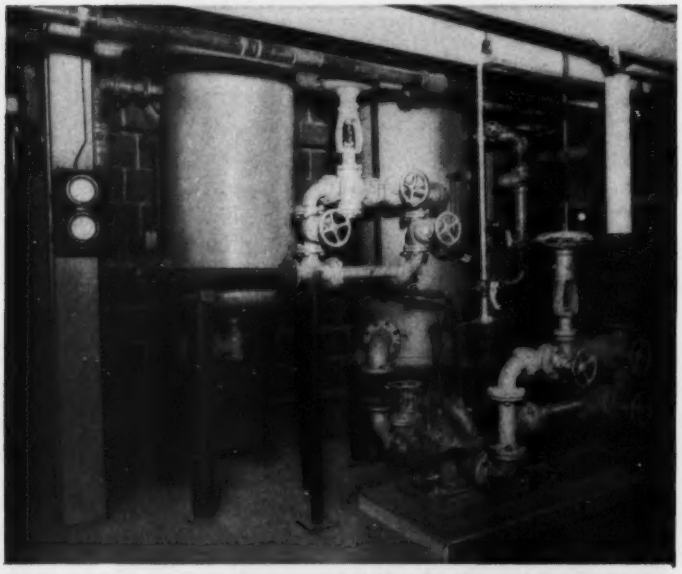
subsidiary of Allis-Chalmers Manufacturing Co.

APPLETON, WISCONSIN

Canadian Representative: Pulp and Paper Mill Accessories Ltd., P. O. Box 850, Station "O", Montreal 9, Quebec

RMF

DRYER DRAINAGE SYSTEMS



help increase production on new and old machines

Paper machines must produce salable, finished products in order to maintain profits for paper making companies. The drying operation is cardinal to the production of this good, salable paper. Consequently, the drying operation should be efficient, fast and free of problems caused by water condensate.

RMF Dryer Drainage Systems can relieve the last, enough to substantially increase drying capacity, and give effective drying at lower temperatures. In addition, RMF Systems can work toward uniform drying across the sheet, assure automatically graduated dryer temperatures and help to lessen shrinkage, cockling, curling, wet streaks and hardening.

Because of these advantages, paper machine builders today include Ross Midwest Fulton Dryer Drainage Systems as favored equipment in their specifications.

If you would like more information on RMF Systems and other RMF products we suggest you write to:

ROSS MIDWEST FULTON · Dayton, Ohio
Division of Midland-Ross Corporation

Feature articles

Northwest increases fine paper capacity

A. W. J. DYCK

▶ The installation of the 200-in. Beloit paper machine at Brainerd, Minn. increases Northwest Paper Co.'s output of fine papers to 550 daily tons.

THE COMPLETION of Northwest's expansion program at Brainerd, Minnesota, was marked by the recent start-up of the company's No. 6 fine paper machine. The entire project at Brainerd as well as most of the detailed engineering was planned and implemented by Northwest's engineering and production staffs.

No. 6 machine increases the daily output of Northwest Paper Co. from 400 to 550 tons of a wide range of fine papers, including high-grade printing, writing, and converting type papers.

Stock preparation

Pulp in lap form, shipped from Northwest's Cloquet mill and supplemented by purchased pulp, is fed by a horizontal pan-type conveyor into a 20 ft. dia. type HS Hydrapulper driven by a 3000 hp motor. The Hydrapulper is equipped with a 90 in. dia. rotor and handles 6000 lb. batches at 4 per cent consistency.

From the Hydrapulper, stock is pumped by a 12-in. Class HMSS dump pump to a vertical dump chest. From here, after blending, the furnish is passed through a No. 6 Hydrafiner and a No. 5 jordan. Its consistency is then adjusted in a consistency regulator prior to being discharged to the machine stock chest. Both dump and machine chests are equipped with vertical propeller agitators.

From the machine stock chest, stock is pumped by an 8-in. Class HMSS centrifugal pump to three No. 5 jordans for final refining and to a consistency regulator for consistency adjustment. Each of the four jordans, as well as the No. 6 Hydrafiner, is driven by a 400 hp motor.

The stock is then pumped by a 9000 gpm pump to a battery of eleven No. 624B Centri-Cleaners in the primary position, a No. 624B Centri-Cleaner in the secondary position and a No. 604 Centri-Cleaner in the tertiary position.

A 15,000 gpm variable speed fan pump, driver by a 400 hp synchronous motor, pumps the stock from the Centri-Cleaners through five No. 24-P selectifier screens of stainless steel construction to the machine's pressurized headbox. The 400 hp motor is equipped with a unique magnetic drive and control system providing a means of adjusting the speed of the fan pump and controlling it within $\pm$ 0.25 per cent.

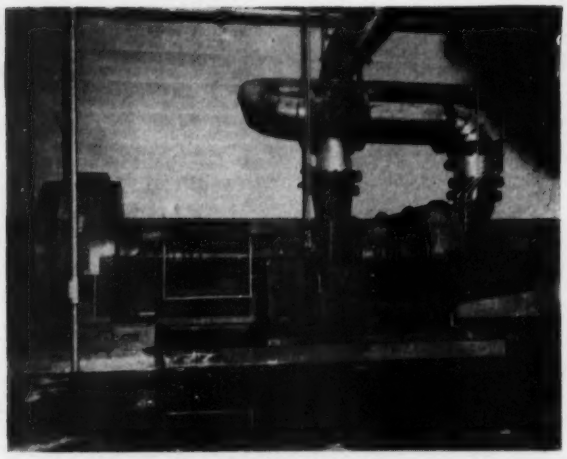
Paper machine

The air cushioned, controlled flow headbox features a single tapered recirculating header with multiple pipes leading to an adjustable throat distributor.

The 2000 fpm fourdrinier is further equipped with a 200-in wide wire; 24 rubber covered table rolls, the first six of which are grooved; a 32 in. dia. breast roll; seven stainless steel suction boxes; a 30 in. dia. electric driven dandy roll; a 36-in dia.

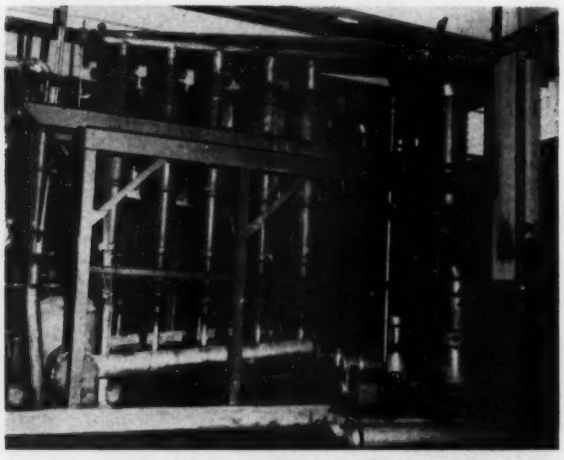
H. T. Kendall Jr. President | J. M. Musser Chairman Bd. of Dr. | M. V. Harris V.P. & Mgr. of Operations | B. I. Nilsen V.P. & Mgr. of Mfg. | C. P. Sheldon V.P. & Gen. Sales Mgr. | B. W. McEachern V.P. & Mgr. of Marketing | A. R. Boquist Treasurer & Controller

Chain Belt rotary-type water screens.

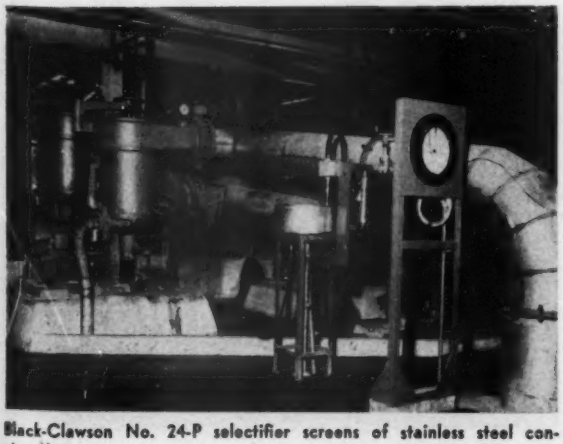


Black-Clawson No. 6 Hydrafiner with 90-in. dia. rotors.

Black-Clawson No. 5 jordans.

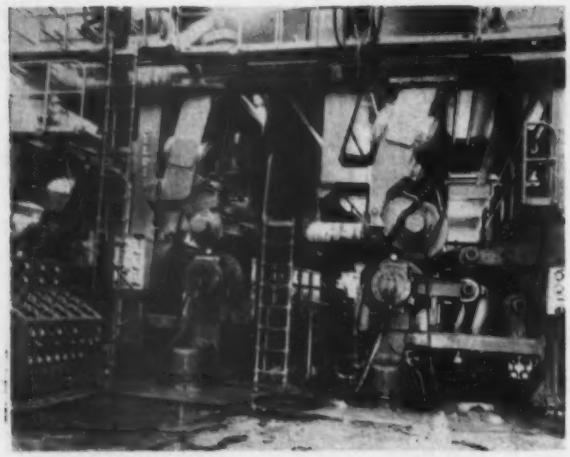


Bauer Bros. No. 624B Centri-Cleaners.

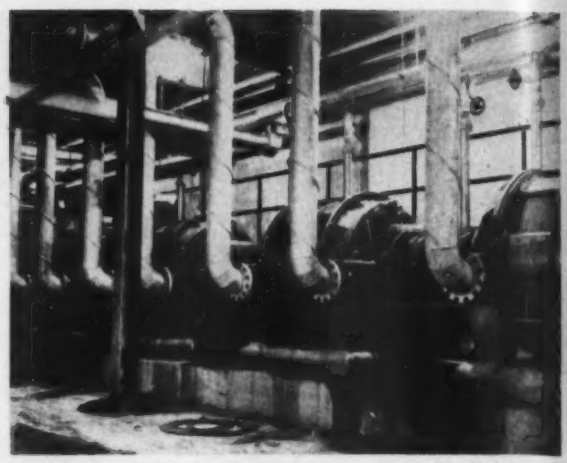


Black-Clawson No. 24-P selectifier screens of stainless steel construction.

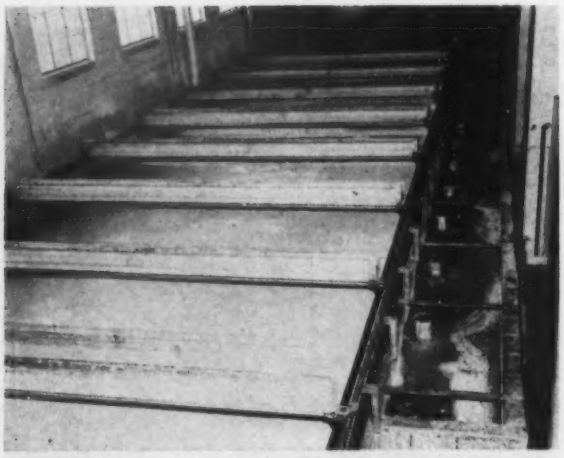
Beloit Iron Works 200-in. wide fine paper machine.



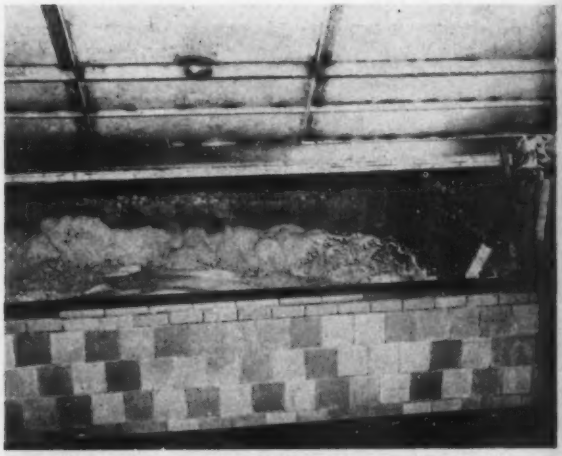
Beloit Iron Works press section of paper machine.



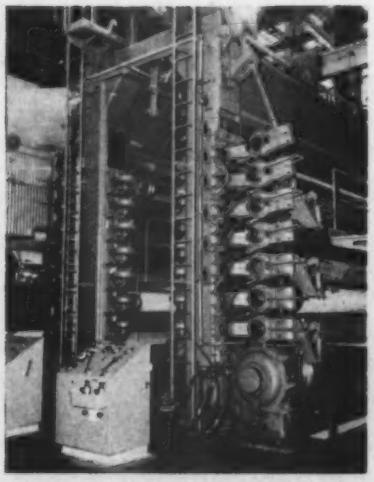
Nash Engineering Co. vacuum pumps line-driven by single steam turbine.



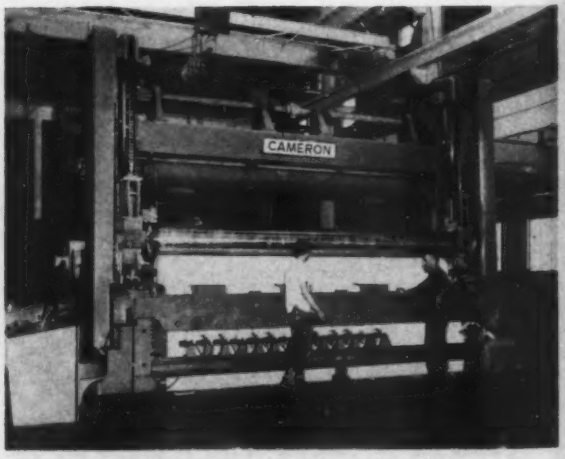
Sveen Pedersen Co. flotation-type saveall featuring special aeration system.



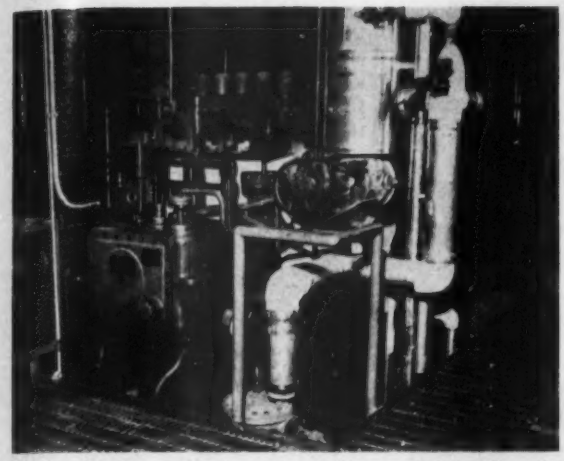
E. D. Jones Corp. Liebeck disintegrator (see also chart).



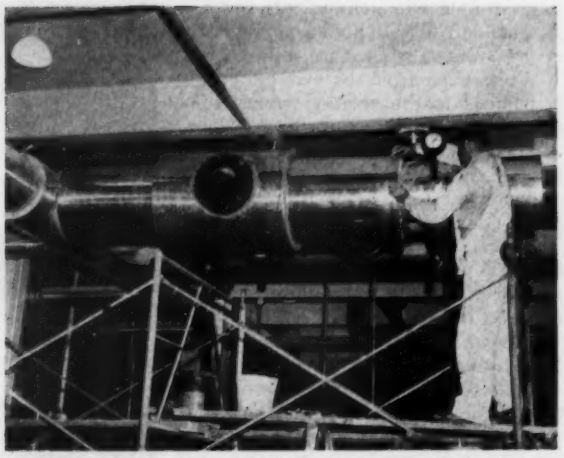
Beloit Iron Works 8-roll, open-face calender stacks.



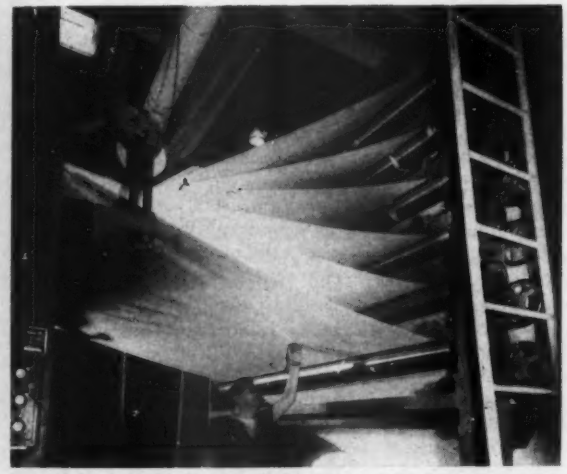
Cameron Machine Co. 6000 fpm winder and slitter.



Worthington Corp. 1650-hp. steam turbine on Beloit differential drive.



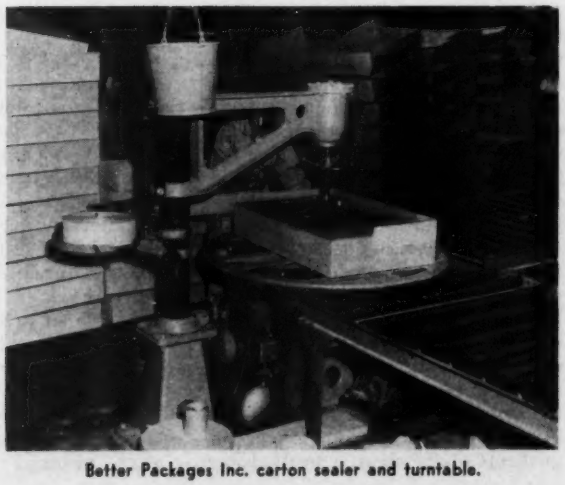
Johns-Manville Sales Corp. Metal-On insulates 15,000 ft. of steam lines.



Fine paper is fed into one of the Clark Aiken Co. cutters.

Cut sheets are thoroughly inspected by experienced operators.

Harris-Seybold Co. Auto-Spacer trimmer.



Better Packages Inc. carton sealer and turntable.

couch roll; a wire tension roll and a wire guide roll with automatic mechanisms; and five wire return rolls.

White water from the wire pit, etc., is pumped to the flotation saveall of 2000 gpm operating capacity and incorporating the "Aqua-Air Spray" aeration system which dissolves twice as much air for greater flotation efficiency and maximum clarification. The saveall has a tile constructed flotation vat, while other parts coming in contact with white water are of stainless steel construction.

The 42-ft. long press section features a suction pick-up and consists of a 28-in dia. suction wringer press, a transfer press, first and second suction presses equipped with 36-in. dia. rubber covered suction rolls, and a smoothing press.

Vacuum for the couch, and suction presses, etc., is supplied by five vacuum pumps arranged in line and driven by a 1,800 hp steam turbine. When the steam turbine is incapacitated, a 900 hp synchronous motor which normally acts as a generator can be used to drive the five vacuum pumps of 850 hp. requirement.

Vacuum for other requirements is supplied by individual pumps driven by electric motors.

The 60-in. dia. dryers are divided into three sections, with a horizontal size press located between the second and third sections. There are a total of 52 paper dryers and 10 felt dryers.

The steam control and condensate drainage system of the dryer section features three cascade pressure groups located before the size press. The wet end group of dryers as well as the felt dryers have independent pressure control systems. The first dryer after the size press is normally operated at low pressures and is also used as a tempering dryer.

A unique feature of the steam control system is the location of the panel, housing the differential pressure control instruments, in the basement. This restricts its use to the instrument men or power engineers and provides additional machine room space.

Then automatic steam control and condensate drainage system ties in with a Dynalog moisture control system, the sensing head of which is located after the calender stack to control final moisture content.

The moisture control system, operating on the principle of electrical capacitance measurement, features a measuring head consisting of a 5-ft. electrical capacitor containing several sets of electrodes which are in continuous contact with the sheet. Since the dielectric constant of water is high in comparison to that of the other ingredients of the sheet, a small change

P. W. Budd, mill manager and E. W. Wolleat, assistant mill manager.

in the water content will produce a large change in the dielectric constant of the sheet. Hence, the effectiveness of this moisture control system.

Effective vapor removal is accomplished by an open type hood of aluminum panel construction sandwiching fiberglass or hardboard insulation material. The hood is completely separated at the size press. Both sections of the hood are equipped with a continuous single sheet aluminum plenum and a system of adjustable dampers, economizers, economizer by-pass for summer ventilation, fans, and ducts. A calender cooling system features high velocity nozzle outlets to cool the bottom roll, third roll, and fifth roll on each calender stack.

There are two open-face calender stacks, each equipped with a 32-in. dia. king roll and seven 15-in. dia. intermediate rolls.

Following the calender stacks, there is a heavy duty, constant speed reel which has a 36-in. dia. drum and is capable of handling 54-in. dia. rolls.

A 6000 fpm, 188-in trim width Imperial winder and slitter is powered by a 200 hp dc motor. Constant tension in the winder is maintained by a magnetic amplifier regulator. The drive also includes a 100/125 hp electric backstand generator.

The winder is equipped with new "quick-set" shear-cut slitting elements, regenerative braking on the unwind, hydraulically operated riding roll lift, rewind roll ejector and rewind shaft injector. Auxiliary equipment supplied with the winder includes a roll lowering table and a shaft puller.

An AccuRay reflection type weight gauge and controller located on the last bottom dryer continuously scans the sheet, records the weight and automatically adjusts the 8-in. Vee-Port stock metering valve to keep the weight within pre-set tolerances. In this system, the source of radiation and detector are located on the same side of the sheet. The measurement signal is sent from the reflection unit to (1) the main operator's control system which houses the X-Y recorder, average recorder and controls; and (2) the two Series "E" consoles mounted in the basement and housing the measuring circuit, profile averaging computer, and automatic control equipment.

Broke recovery

Broke is recovered in three broke pulpers, located under the couch, size press, and calender stacks.

The broke pulper located in the couch pit is an agitator unit equipped with an automatic level control which delivers the stock at approximately 4 per cent consistency to a broke chest. Broke from the second press is shredded in a high speed shredder equipped with a series of nozzle jets supplied with water under 50 psi pressure. The shredder, powered by a 30 hp motor, further features a ductor which serves as an anvil to the passing shredder teeth and which is operated by a pneumatic cylinder. The shredder delivers shredded broke to the couch pit, from which it is pumped to a cylindrical-type thickener and then into the broke chest.

The second broke pulper located under the size press is a single shaft Liebeck disintegrator equipped with level control to pump stock to the third pulper. The control in the second pulper will automatically shut down this unit when the low level is reached.

The third pulper, located under the last dryer, calender, and reel, is a twin shaft Lieback disintegrator, equipped with level and consistency control. Both shafts run continuously to break up winder trim and reel slabs.

Paper machine drive

The paper machine drive is of a mechanical differential type powered by a 1650 hp multistage steam turbine.

The turbine is of the automatic nozzle control design with multiple cam operated inlet valves. A governor is used to control its speed over a 4:1 range and to limit speed variation at any given speed setting to ± 0.1 per cent. A double helical single reduction gear, connected to the turbine by a flexible coupling, permits a maximum line shaft speed of 1000 rpm.

Both turbine and reduction gear are mounted on a common base plate and are force-feed lubricated from an oil

Principal equipment installed at Northwest's Brainerd mill

Stock preparation

Centri-Cleaners (13), 12 No. 624B, one No. 604 ..... Bauer Bros. Co.
Consistency regulators (2) ..... DeZurik Corp.
Dump chest, tile, with vertical propeller agitator ..... Chemical Linings Inc.
Dump pump, 12-in., Class HMSS ..... Black-Clawson Co.
Fan pump, variable speed, 15,000 gpm ..... Goulds Pumps Co.
Fan pump motor, 400 hp, with magnetic drive and control system ..... Electric Machinery Mfg. Co.
Hydrafiner, No. 6, driven by 400-hp motor, equipped with 90-in. dia. rotors, ... Black-Clawson Co.
Hydrapulper, 20-ft. dia., HS type, driven by a 3000-hp motor ..... Black-Clawson Co.
Jordans (4), No. 5, driven by 400 hp. motors ..... Black-Clawson Co.
Jordan motors (5), 400-hp. synchronous with E-M motor controls ..... Electric Machinery Mfg. Co.
Machine chest, Chemtile, equipped with vertical propeller agitator ..... Chemical Linings Inc.
Pulp conveyor, pan-type, horizontal ..... Black-Clawson Co.
Selectifier screen (5), No. 24-P, stainless steel construction ..... Black-Clawson Co.
Stock pump, 8-in., Class HMSS, centrifugal ..... Black-Clawson Co.
Stock pump, 9,000 gpm, for pumping stock to Centri-Cleaners ..... Allis-Chalmers Mfg. Co.

Paper machine room

Air system, consisting of aluminum panel hood, ducts, fans, economizers and calender cooling system ..... J. O. Ross Engineering Co.
Broke pulpers (3), one agitator unit with automatic level control; one single shaft Liebeck disintegrator; and one twin shaft Liebeck disintegrator ..... E. D. Jones Corp.
Broke shredder, equipped with nozzle jets and powered by a 30-hp motor ..... Improved Machinery Inc.
Calender stacks (2), open-face, each equipped with 32-in. dia. king roll and seven 15-in. dia. intermediate rolls ..... Beloit Iron Works
Chemplate linings on wire and couch pit and on white water chest ..... Chemical Linings Inc.
Chests, Chemtile, broke, machine and beater .... Chemical Linings Inc.
Clay mixing tanks ..... Chemical Linings Inc.
Dryers (62), 60-in. dia., 52 paper dryers and 10 felt dryers ..... Beloit Iron Works
Electric helper drives (8), with two 200 KW generators ..... Westinghouse Electric Corp.
Fourdrinier, 2000 fpm, 200-wide wire, seven stainless steel suction boxes, 36-in. dia. couch, etc. ..... Beloit Iron Works
Headbox, with tapered recirculating header, multiple pipes, and adjustable throat distributor ..... Beloit Iron Works
Moisture control system, Dynalog, electrical capacitor type, with sets of electrodes ..... Foxboro Co.
Paper machine drive, mechanical differential, gear boxes and PIV control ..... Beloit Iron Works
Paper machine drive turbine, 1650 hp., of automatic nozzle control design and multiple cam operated inlet valves ..... Worthington Corp.
Press section, consisting of suction wringer press, transfer press, two suction presses and smoothing press ..... Beloit Iron Works
Reel, heavy duty, constant speed, with 36-in. dia. drum ..... Beloit Iron Works
Roll lowering table on Imperial winder ..... Cameron Machine Co.
Rubber covered rolls, press and table ..... Raybestos-Manhattan Inc.
Saveall, flotation type, 2000 gpm capacity, with "Aqua-Air Spray" aeration system ..... Sveen Pedersen Co.
Shaft puller ..... Cameron Machine Co.
Steam control and condensate drainage system, three cascade pressure group arrangement ..... Ross Midwest Fulton Corp.
Steam turbine, 1,800 hp, on vacuum pumps ..... Elliot Co.
Tanks, Chemtile, slurry storage and mix ..... Chemical Linings Inc.
Vacuum pumps (5), line-driven by a 1,800-hp steam turbine ..... Nash Engineering Co.
Vacuum pumps motor, standby, 900-hp. synchronous ..... Electric Machinery Mfg. Co.
Vat, Chemtile, on Sveen Pedersen saveall ..... Chemical Linings Inc.
Weight control system, AccuRay reflection type, located on the last dryer; includes main operator's control station and two series "E" consoles ..... Industrial Nucleonics Corp.
Winder and slitter, Imperial, 6000 fpm, equipped with "quick-set" shear-cut slitting elements, regenerative braking, etc. ..... Cameron Machine Co.
Winder drive, 200-hp. dc. motor and backstand generator ..... Westinghouse Electric Corp.

Finishing operations

Auto-Spacer trimmers (3), two 85-in and one 100-in, equipped with lift tables, unstackers, air film tables, conveyors, etc. ..... Harris-Seybold Co.
Backstands (2), 10- and 8-roll ..... American Mfg. Co.
Carton sealer turntable, equipped with pressing device, automatic tape applying mechanism, patented tape moistening method etc. ..... Better Packages Inc.
Cutters (3), 64-in., 112-in. and 118-in., featuring differential drives, enclosed oil bath gear boxes, timing belts, etc. ..... Clark-Aiken Co.
Fork lift trucks (3), Challenger No. 40 type ..... Hyster Co.

Power and Steam supply

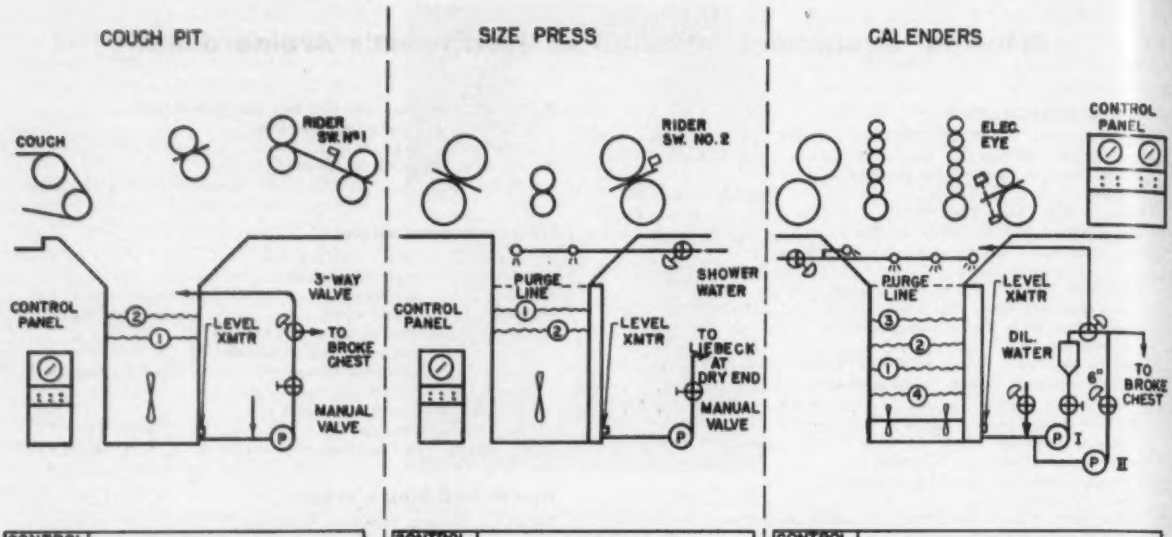
Boilers (2), Sterling, 75,000 lb. steam/hr. capacity each, equipped with Rotograte stokers ..... Babcock-Wilcox Co.
Generator, 900 hp driven by 1,800-hp steam turbine ..... Electric Machinery Mfg. Co.
Instrumentation ..... Bailey Meter Co.
Pipe insulation, Metal-Ox, Thermobestos and Micro-Lok fiber glass ..... Johns-Manville Sales Corp.
Power panels ..... Commonwealth Electric Co.
Switchgear, Unitrol control centers ..... Cutler Hammer Inc.

Water supply

Accelator, 7,500,000 gal/day — Infilco Inc.
Accelator, "Hot-Flow" softener — Infilco Inc.
Chemical mixers and feeders — Infilco Inc.
Ion exchangers (2), Catexer with deaerating heaters — Infilco Inc.
Pressure filters, Type R, 60-in. — Infilco Inc.
Raw-water pumps (3), Pomona vertical turbine pumps, 2,500 gpm each, driven by 75-hp motors — Fairbanks-Morse & Co.
Screens, rotary type — Chain Belt Co.

General

Clay preparation system, automatic, including differential pressure pneumatic transmitter, pneumatic indicator integrator and micro-switch — Fischer & Porter Co.
Fire pumps (3), 1000 gpm each — Fairbanks-Morse & Co.
Instruments and controls — Fischer & Porter Co.; The Foxboro Co.; Minneapolis-Honeywell Regulator Co.; Taylor Instrument Co.
Lead-lined steel pipe, 2-in. and 1¼-in. — National Lead Co.
Motors, electric — Electric Machinery Mfg. Co.; Louis-Allis Co.; Westinghouse Electric Corp.
Oscillating doctors — Lodding Engineering Co.
pH control system, Speedomax G. Model — Leeds & Northrup Co.
Pipe, 3-in., 4-in. and 6-in. stainless steel — Felker Bros. Mfg. Co.
Pipe, spiral weld for vacuum system — Naylor Pipe Co.
Plastic Immersion mounting with electrodes and temperature compensator — Leeds & Northrup Co.
Press rolls, including 28-in. dia. transfer roll, 28-in. dia. wringer roll, 28-in. dia. Prestow smoothing roll, 27-in. dia. Microrok smoothing press roll, sizerite press roll, etc. — Stowe-Woodward Inc.
Pumps — Allis-Chalmers Mfg. Co., Fairbanks-Morse & Co., Goulds Pumps, Inc., Ingersoll-Rand Co.
Size press roll, 27-in. dia. Microrok — Stowe-Woodward Inc. Manhattan Rubber Div.
Starch cooker, 4,200 gal. cap., Type 304 ELC stainless steel ..... Felker Bros. Mfg. Co.
Tanks, two for color storage, two for starch storage, two separan mix tanks, all of type 304 ELC stainless steel construction — Felker Bros. Mfg. Co.
Valves — Crane Co., DeZurik Corp., Edward Valves Inc., subsidiary of Rockwell Mfg. Co., S. Morgan Smith, Walworth Co., R & S Valves.



CONTROL POINT	ACTION
1	3-WAY VALVE TURNS TO RECIRCULATE ON DECREASING LEVEL.
2	3-WAY VALVE TURNS TO BROKE CHEST ON INCREASING LEVEL.
PRESS BREAK	STARTS SHREDDER AND CONVEYOR. ALSO OPENS DILUTION VALVES. (OPTIONAL)

CONTROL POINT	ACTION
1	PUMP STARTS TO LIEBECK AT DRY END ON INCREASING LEVEL.
2	PUMP SHUTS DOWN ON DECREASING LEVEL. ROTOR SHUTS DOWN AFTER TIMED PERIOD.
PURGE LEVEL	CLOSES SHOWER WATER VALVE ON MANUAL OPERATION IF OPERATOR FAILS TO DO SO.
SHEET ENTERING SIZE PRESS PIT	SHOWER VALVE OPENS TO PRE-SET MAXIMUM. SHOWER VALVE CLOSES AT END OF BREAK.

CONTROL POINT	ACTION
1	3-WAY VALVE OPENS TO RECIRCULATE ON DECREASING LEVEL.
2	3-WAY VALVE OPENS TO SYSTEM ON INCREASING LEVEL.
2 - 3	PUMP II STARTS & 6" AUTOMATIC VALVE GOES FROM FULL SHUT TO FULL OPEN.
PURGE LEVEL	SAME AS LIEBECK UNDER SIZE PRESS.
4	SHUTS DOWN PUMPS, OPENS SHOWER VALVE & SOUNDS CUSTOMER'S ALARM. PUMPS START AFTER TIME DELAY IF LEVEL HAS RISEN.
SHEET ENTERING LIEBECK	OPENS SHOWER VALVE TO PRE-SET MAXIMUM. SHOWER VALVE CLOSES AT END OF BREAK.

Schematic of broke and trim handling system.

reservoir located in the base plate.

Electric helper drives consist of (1) four helper motors on the fourdrinier section which are supplied by a 200 KW generator; (2) four helper motors on the press section supplied by a 200 KW generator; and (3) a helper motor on the size press. The two 200 KW generators are regulated by static type Magamp regulators.

Finishing operations

Constant flow of paper through the finishing area is assured by three cutters—classed as 64-in., 112-in., and 118-in.—which incorporate a differential drive, a completely enclosed oil bath gear box, timing belts to replace former gear and chain drives, a sectionalized p'ling platform, and quick-threading decurlers on the roll back stands. These cutters supply three hydraulic Auto-Spacer trimmers (two 85-in. and one 100-in.) which are equipped with lift tables, unstackers, air film tables, conveyors, air lances, straddle tables and spear stackers.

Finished paper sheets are packed in corrugated board containers and sealed in an efficient carton packing unit. The unit is equipped with (1) a pressing device to squeeze out all air from between the sheets, (2) automatic tape applying mechanism, (3) patented tape moistening method with self-adjusting brushes having micrometer water control, and (4) conveyor rollers to permit the cartons roll onto and off the turn table.

Paper packages in the warehouse are handled by three No. 40 fork lift trucks designed for accessibility, easy maintenance and operator comfort.

Power and steam supply

Two 2-drum boilers, each with a capacity to deliver 75,000 lbs. of steam per hour at 750° F and 600 psi pressure, provide the steam requirements of the new mill. The boilers are fired by Rotograte stokers with provisions for future gas firing.

A 1,800 hp. steam turbine, which drives the 850 hp. vacuum pump system, also drives a 900 hp motor which is interchangeably used as a power generator.

There are also five hydro-generators generating 2,000 KW/hr. under favorable water conditions. Additional power is purhcased from the Minnesota Power & Light Co.

Approximately 15,000 ft. of Metal-On pipe insulation was applied to the steam lines connecting the two boilers and to the steam lines leading to the new paper machine and auxiliary equipment. The pipe fittings are insulated with prefabricated Thermobestos, finished with insulating cement, canvas and aluminum paint.

Water supply

Water is pumped from the Mississippi River by three 2,500 gpm Pomona water lubricated vertical turbine pumps driven by 75 hp. vertical hollow shaft motors. It is pumped through rotary type screens to the new 7,500,000 gal. per day Accelator.

New equipment for boiler feed water treatment includes: (1) an Accelator "Hot-Flow" softener which provides deaeration and softening in a concurrent operation; (2) chemical mixers and feeders, (3) two 60-in. Type R pressure filters; and (4) two Catexer ion exchangers with deaerating heaters.

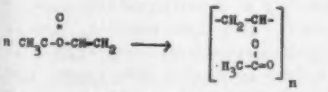
A total length of 500 ft. of cold water piping and mill water piping are insulated with Micro-Lok fiber glass covered with .006-in. and .016-in. thick corrugated aluminum jacketing.

Adhesives in the paper industry

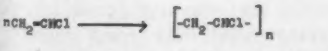
Part VII (Continued): Synthetic resin adhesives — polyvinyl alcohol and polyvinyl acetate

Vinyl resins are produced by polymerizing small molecules which contain one or more double bonds. The simplest unsaturated hydrocarbon, ethylene, can, of course, be polymerized to polyethylene as the following equation indicates:

Although polyethylene finds wide usage as a packaging film and as a raw material for molded items, it plays a relatively minor part in the field of adhesives. The only successful application here seems to be in the form of hot melt adhesives and in heat sealing applications. Other small molecules, on the other hand, such as vinyl acetate and vinyl chloride may be polymerized to provide resins which are of great interest to the adhesives chemist. The polymerization of these monomers is indicated by the following equation:



Vinyl Acetate — Polyvinyl Acetate

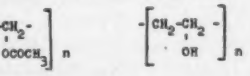


Vinyl Chloride — Polyvinyl Chloride

Not only does the adhesives chemist have polyvinyl acetate and polyvinyl chloride at his disposal, but he also has available a variety of copolymers based on these two monomers.

The vinyls are available for use as hot melts, as solvent solutions and as water dispersions. They are also available in relatively new forms known as plastisols and organosols. These are dispersions of the vinyls in plasticizers and organic solvents, respectively. To the adhesives chemist, the water-dispersed or latex forms are probably the most valuable.

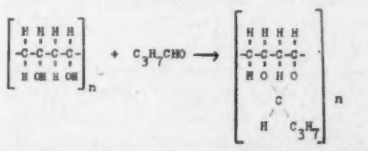
When polyvinyl acetate is hydrolyzed, polyvinyl alcohol results, as indicated by the following equation:



Polyvinyl alcohol is also a valuable adhesive and is used as a thickener and stabilizer for a wide variety of water-based glues and adhesive materials.

Polyvinyl alcohol differs from all of the other vinyl adhesives because of its water solubility. When dissolved in water, it forms a viscous colloidal solution which itself has adhesive properties. For this reason, it is important as a stabilizer for other water-based adhesives to which it provides viscosity control as well as stability.

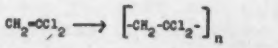
Polyvinyl alcohol may be converted into polyvinyl butyral, as indicated by the following equation:



Polyvinyl Alcohol — Polyvinyl Butyral

Polyvinyl butyral is important because it is the basis for the interlayer of safety glass.

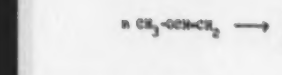
A different type of vinyl polymer results when vinylidene chloride is polymerized according to the following equation:



Vinylidene Chloride — Polyvinylidene Chloride

Vinylidene chloride may also be copolymerized with a variety of other monomers including vinyl chloride and acrylonitrile.

Polyvinyl ethers obtained by the polymerization of monomers such as vinylmethyl ether, as indicated in the following equation,



are also interesting because of their adhesive properties.

Polyvinyl acetate adhesives

Polyvinyl acetate adhesives have excellent adhesive properties and resist weak acid, alkaline and salt solutions. They have good heat-seal properties and can be modified with plasticizers to obtain any degree of flexibility desired. They are also compatible with a number of other film forming materials.

The various grades of polyvinyl acetate resins differ in their degree of polymerization and hence in their molecular weights. Solution viscosity, toughness, film strength and softening temperature increase with increasing molecular weight.

The use of plasticizers with polyvinyl acetate adhesives is necessary with a view to increasing the flexibility and tackiness and lowering the heat-sealing temperature of the adhesives. In the case of hot-melt formulations, plasticizers are used to lower the melting point.

Polyvinyl acetate resins are compatible with a large number of plasticizers including abeitates, diethyl phthalate, dibutyl phthalate, dibutoxyethyl phthalate, Flexols 3 GH and 4 GO glycolates, Santicizers B-16, M-17, 140, 141, 160, tricresyl phosphate, etc. While they are not compatible with certain oils, such as linseed and soya oils, the addition of hydroxylated linseed oil or soya oils in conjunction with active plasticizers will produce rubbery films. Plasticizers should be added slowly, with stirring, to insure uniform distribution. For most applications, plasticizers are used in quantities of 15 to 25 per cent based on the dry resin content of the formulation.

To serve as adhesives, polyvinyl acetate resins are compounded into solutions, emulsions, or hot-melts.

Solutions of polyvinyl acetate are generally referred to as lacquers. A typical composition might include polyvinyl acetate, plasticizer, and a solvent combination of methyl or ethyl acetate, acetone and toluene. Polyvinyl acetate resins are also soluble in other ketones and esters and in chlorinated hydrocarbons, nitroparaffins and the lower boiling aromatic hydrocarbons. They are also soluble in the lower boiling alcohols containing small quantities of water. They are insoluble in anhydrous alcohols with the exception of methyl alcohol.

In the formulation of adhesive solutions, less active solvents, such as xylene and hydrogenated naphthas, may be used as diluents in the presence of the active solvents mentioned.

Polyvinyl acetate emulsions are of particular interest to the paper manufacturing industry because of their wide compatibility with natural and synthetic rubber latices and with other resin and non-resinous emulsions. These emulsions are also important because of their lack of odor, taste and color. An added advantage is their good moisture and moisture vapor resistance. They are easily applied to paper by conventional and automatic equipment, permitting application at high machine speed.

Their popularity with paper manufacturers further stems from the fact that the emulsions provide adhesives with high solids content and relatively low viscosities. They also eliminate the use of expensive, flammable and sometimes toxic solvents.

Polyvinyl acetate emulsions "set" very rapidly and, for this reason, are used for manufacturing of bags from transparent film, inserting carton and envelope windows, and for a variety of laminated sheets. They are used for bonding waxed surfaces. They find application in case and carton sealing, foil and film laminations, laminations of papers for special purposes, folding and set up box manufacturing, and uses where waxed and coated papers are required.

The emulsions, appearing as milk-white liquids containing 55 to 57 per cent solids, show good mechanical and chemical stability and are easily compounded. The films produced from these emulsions have essentially the same properties as those produced from polyvinyl acetate solutions, with the exception that they have slightly lower transparency, gloss and water resistance.

In addition to serving as adhesives, polyvinyl acetate emulsions can be used to stiffen, strengthen and greaseproof paper products. They can also be used to increase the abrasion resistance of paper products.

Hot-melt adhesives of polyvinyl acetate usually contain plasticizers and low melting resinous materials, such as damar gum, or rosin derivatives, such as the rosin ester of pentaerythritol. Solid plasticizer and chlorinated biphenyl or terphenyl are often used in hot melts. These solid and viscose plasticizers help to create sharp melting and congealing points of the hot melt adhesives. In commercial applications, hot-melts are usually applied to the stock from intaglio rolls. Hot melt adhesives are especially suitable for use in book binding and fiber container making.

Polyvinyl alcohol

Polyvinyl alcohol is a versatile, water-soluble synthetic resin with high film strength (up to 22,000 lb/sq. in.) and excellent adhesion to porous materials. These properties permit considerable dilution of polyvinyl alcohol with low-cost extenders such as starch, dextrin and lignin sulfonates. The resin can be formulated into a variety of adhesives and binders for the paper industry.

Polyvinyl alcohol is available in several grades, in accordance with their degree of polymerization. The low molecular weight resins are soluble in cold water and are suitable for use as remoistenable adhesives.

The high-molecular weight resins are less soluble in cold water and are therefore especially suitable for use as water-resistant adhesives. They may also be compounded with polyvinyl acetate in addition to starch, dextrin and other fillers. They are widely used as boxboard, wallboard and tube winding adhesive formulations where good adhesive and water-resistant properties are required.

Where maximum water resistance is required, the use of an insolubilizing agent, such as dimethylol urea in conjunction with an acid catalyst such as ammonium chloride or "Quilon" stearate chromic chloride is suggested.

A variety of adhesive formulations is made with polyvinyl alcohol and starches, most of the latter being compatible with the resin with the exception of borated starches which show a tendency to gel polyvinyl alcohol. Relatively small quantities of polyvinyl alcohol (10 to 30 per cent) considerably increase the adhesive strength and moisture resistance of starch adhesives.

Polyvinyl alcohol is also an excellent binder for pigments such as titanium dioxide, clay, calcium carbonate, whiting, etc., in paper coatings. Here it is used in concentrations of 3 to 5 parts per 100 parts of pigment, although more is needed to bind calcium carbonate. The coatings thus produced are tough, flexible and show little tendency to curl. Due to the low binder content, the coatings also retain a maximum in brightness and have good printing qualities.

Penobscot installs new one-half million dollar wet end

▶ The installation of an Improved Machinery Inc. feltless wet end machine increases Penobscot's daily sulfite pulp drying capacity to 200 tons.

A $500 thousand step forward in the long range modernization plan at Penobscot Chemical Fibre in Old Town, Maine, was completed recently with the installation and operation of a feltless wet-end machine and vapor absorption system in the sulfite mill. Penobscot, an old-line highly regarded supplier of market pulps, thus adds the latest in machine operation to its modern chlorine dioxide bleaching system.

The vacuum cylinder wet-end, supplied by Improved Machinery Inc., was installed by Penobscot's personnel working in close cooperation with Improved Machinery's engineers. With the installation of this new piece of equipment, the pulp drying capacity of the sulfite mill has been increased to 200 tons of market pulp per day.

Under the new system, stock leaves the bleacher room to pass through a De-Zurik consistency regulator delivering pulp at one-half per cent consistency to the flat screens. From here the pulp is pumped to batteries of Bauer cleaners (primaries, secondaries and tertiaries). Accepted stock from the cleaners is fed to the wet-end cylinder vat.

The wet-end itself consists of a stainless steel-lined vat, and 11½-ft. dia. by 124-in. cylinder, one 16-in. diameter stainless steel forming roll, and two 20-in. diameter rubber-covered press rolls with grooved surfaces.

The first and second presses have 36½-in. diameter grooved cast iron top and bottom rolls. Designed pressure on the first press is 1700 lbs. per linear inch and 2700 lbs. per linear inch for the second press. Both presses are equipped with air cylinders for lifting and loading. In event of a break in the sheet, the presses automatically unload.

The distance between the second press and the dryers is spanned by nine 6⅝-in. brass table rolls on anti-friction bearings, thus providing space for future dryers.

The cylinder, presses and dryers are driven by a 200-hp Elliott steam turbine. Exhaust from the turbine is used to heat the dryers. The drives on the presses and cylinder are equipped with Fawick clutches and cone pulleys for variable speed. Air-controlled dancer rolls follow the cylinder, first press and second press. These rolls automatically control the speeds of each unit.

Instrumentation for the wet-end machine was supplied by Bailey.

The vapor absorption system and economizer was engineered by Chas. T. Main Co. and furnished by J. O. Ross Engineering Co. The system consists of heating fresh outside air, absorbing moisture from the pulp sheet, and recovering heat from the moisture-laden discharge air. The air movement is effected by an 81,200-cfm exhaust fan and a 58,700-cfm fan for vapor absorption.

Soda mill expansion

With the addition of a $78,000 installation of Bauer cleaners, Penobscot's soda mill can deliver to the market ultra-clean pulp bleached in a modern five-stage bleach plant.

Three stages of Bauer cleaners plus two Magna cleaners do a most efficient job of removing shives and dirt. The two No. 641 36-in. Magnas in the primary feed operate on the same free vortex principle as the smaller No. 606, 6-in. cleaners and remove large dirt pieces. An Ingersoll-Rand 12AFV pump sends stock to the Magnas which handle large capacities at a low pressure drop and deliver directly to the 41 Bauers in the primary stage without an intermediate pump.

Primary accepts are sent directly to the 84-in. and 118-in. machine vats, the rejects being collected in a reject trough and pumped by means of an Ingersoll-Rand 5CORVL pump to the secondaries consisting of six No. 606 Bauers. The reject trough is equipped with a control device for maintaining constant water level by admitting dilution water.

Secondary accepts are returned to the primary feed and secondary rejects are pumped to the tertiary stage of one No. 606 Bauer cleaner.

Tertiary accepts are pumped to the secondary feed while tertiary rejects are discarded.

Designed capacity of the cleaning system is 165 tons per day.

The use of pipe, fittings, pumps and valves in the pulp and paper industry

ROLAND L. ALLEN JR.

Vice President, Eastern Engineering Co.

Part X — Application of pipe, fittings, pumps and valves in groundwood pulping

GROUNDWOOD or mechanical pulping produces paper-making pulp by mechanically reducing wood to fiber form. This is usually done by pressing logs against a revolving stone until they are ground to the desired pulp. This process requires large quantities of power and water. The power used varies from about 50 to over 100 horsepower days per ton of pulp produced and the water used varies from about 1000 to 10,000 or more gallons per ton. Both vary according to the specie of wood used and the end use of the pulp.

Groundwood pulp is economical, where the end product allows its use, because of its high yield. Over 90 per cent of the peeled wood is converted into useable pulp. The loss is due primarily to water-soluble matter in the pulp and fiber in excess white water that is sewered.

Groundwood pulp is used in various types of paper and board, but the major portion of the groundwood pulp produced is used in newsprint. Since this is the case, we will use newsprint grade groundwood as the basis for this discussion.

Grinder system

As stated above, the grinder consists of a revolving stone with a mechanism for pressing the logs against the revolving stone. All of the grinders available today have these two features in some single or multiple arrangement (not multiple stones, but multiple pressing mechanisms). The grinder shown on the flow sheet is a Great Northern-Waterous grinder. This grinder has a pulpwood pocket with a pressure foot on each side of the stone. Each pressure foot is actuated by a hydraulic cylinder. The two pulpwood pockets provide continuous production since one pocket may be filled with pulpwood while the other pocket is in production.

Piping for a Great Northern-Waterous grinder primarily consists of hydraulic cylinder supply and return, high pressure stone cleaning shower piping and stone cooling and pulp dilution shower piping. The hydraulic fluid used for pressure foot cylinder actuation is usually water with some form of rust inhibitor such as soda ash. The stone is usually cleaned with high pressure fresh water and the cooling and dilution shower is usually supplied with white water.

The hydraulic system usually consists of a reservoir, multiple stage centrifugal pumps, an air-padded pressure reservoir or accumulator, and the pressure foot cylinder. These items are connected to each other with piping materials of sufficient strength to withstand the operating conditions. Since the pressure is usually in the 300 psig class, carbon steel piping materials are normally used. Piping may be ASTM A-120 or A-53 carbon steel and valves are usually Class 300 cast carbon steel in sizes 2½ in. and larger and forged carbon steel in sizes 2 in. and smaller. Pipe fittings may be forged carbon steel for sizes 2 in. and smaller and weld-end steel for sizes 2½ in. and larger. Class 300 cast carbon steel flanged fittings may be used where convenient.

Since the hydraulic system is subject to shock, screwed joints are not usually satisfactory unless seal welded. Therefore, socket-welded joints are normally used for sizes 2 in. and smaller and butt-welded joints for sizes 2½ in. and larger. Flanged joints are used where required for connection to flanged equipment.

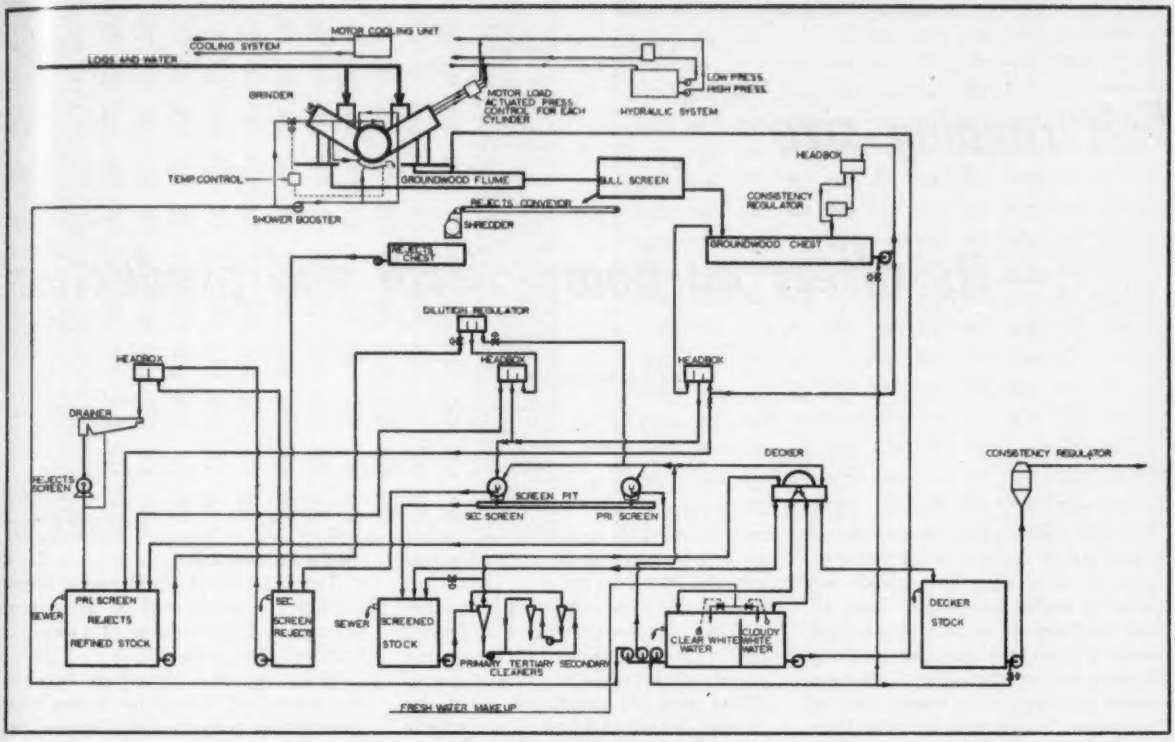
Fresh water piping is of the same materials of construction as used elsewhere in the mill. This is normally black or galvanized carbon steel pipe with black or galvanized malleable iron fittings and brass or brass-trimmed cast iron valves.

White water may be copper, brass, or stainless steel. Normally, AISI type 304 or type 316 stainless steel of thin-wall construction is used. Carbon steel or cast iron are generally not used due to the adverse effect they have on the brightness of the groundwood pulp. As previously stated, groundwood pulp contains water soluble substances. These water soluble substances are acid in nature and cause corrosion of carbon steel and cast iron. The white water is not sufficiently acid to cause rapid failure of cast iron or carbon steel, but the iron picked up in the white water from cast iron or carbon steel causes an appreciable loss in groundwood pulp brightness.

Ground pulp screening system

When a properly operated grinder (with the correct stone properly dressed) reduces a log to pulp the majority of the pulp is sufficiently refined to be useable in the machine furnish after it has had any dirt or stone particles removed that it might contain. Some of the wood may break off the log in the form of splinters, shives, slivers or scraps. To remove these unpulped particles of wood, the pulp discharged from the grinder is passed through a series of screens.

The first screen is for removal of coarse material and is called a coarse screen or bull screen. The material removed by this screen may be as large as an inch or more in diameter and as long as the log originally charged into the grinder pocket. This coarse material is rejected by the screen and passes to a hammer mill or other similar device where it is reduced to small



Flow sheet of groundwood pulping system.

splinters and is mixed with the screen rejects from the second screening stage.

The accepted stock from the coarse screen is pumped to a primary screening system where all oversize material is rejected. Since some acceptable pulp is rejected along with the oversize material, the primary screen rejects are pumped to a secondary screen where the acceptable pulp is recovered (and added to the accepted pulp from the primary screen) and the oversize material is again rejected.

The secondary screen tailings and the bull screen rejects (after passing through the hammer mill) are mixed and pumped to a drainer where the water is removed and the tailings supplied to a disc refiner where they are fiberized. After passing through the refiner, the refined material is again mixed with water and pumped back to the secondary screen where any oversize material that was not properly refined is again removed and recycled through the refiner.

The pulp accepted from the primary and secondary screen is pumped through a centrifugal cleaning system where dirt and grind stone particles are removed. The accepted stock from the centrifugal cleaning system passes to a decker where some of the water is removed and the pulp slurry is thickened so that it may be economically stored until needed for the paper machine furnish.

The white water removed by the decker is reused at the grinder and at other points as shown on the flow sheet.

All pipe, fittings, valves and pumps used in the pulp and white water systems must be copper, brass, bronze, or stainless steel. Pipe and fittings may be asbestos cement or asbestos cement lined steel.

Valves for white water service may be of the wedge gate design, while those for pulp service should be of the pulp stock type.

As shown on the flow sheet, some groundwood deckers are equipped with two white water outlets. One of these outlets discharges clear white water and the other discharges cloudy white water. This arrangement is necessary due to the fact that the groundwood pulp contains a high percentage of fines and when water is removed on the decker, some of the fines pass through the wire on the decker with the water. This initial flow of water through the wire carries a higher percentage of fiber than the subsequent flow due to the fact that a better filter medium is obtained after a mat of pulp is formed on the wire. The internal construction of this type of decker is such that the initial flow of water through the wire is valved to flow through the cloudy white water outlet while the subsequent flow is valved to the clear white water outlet.

Since groundwood pulping does not employ high temperatures or strong chemicals, the system is highly susceptible to bacterial and fungus attack. For this reason, all piping and equipment must be designed in such a way that it is easy to clean and, to a certain extent, self cleaning.

In the design of piping systems, care should be exercised to see that no dead pockets are present where stagnation and spoilage may occur. The velocities in white water and stock lines should be kept at 8 to 12 ft. per second wherever possible. The system should be arranged so that it is self draining when out of service or, if this is not possible, provision should be made whereby any portion of the system that is not self draining may be drained.

Pumps for white water service may be of either the end suction or double suction types with closed impeller with wear rings relieved so that excessive wear or binding will not occur from the fiber present in the water. Pumps for stock service should be of the end suction type with open impeller.

Felt running size

— its effect on board finish and production

DAVID McCONAUGHY

Felt Designer
Albany Felt Company

ONE FACTOR frequently overlooked in the search for improved felt performance is accurate information on operating length and width. Since all paper machines have their own unique characteristics, felts must be carefully designed for a particular position on a specific machine. The actual running dimensions of the felt for that position are among the primary considerations of the felt designer.

It is true that the requirements for drainage, finish and strength — the well-known "eternal triangle" of felt design — are probably upper-most in the designer's mind. But, unless the felt is designed to fit a machine, no amount of attention to any or all of these factors will result in optimum finish and top production.

How errors occur in designed size

How do errors occur in anything so basic as the size of a felt? There are several reasons. First, paper machine operating conditions can vary from day to day. Unless accurate periodic measurements of the operating length and width are taken and passed on to the designer, a felt may appear to fit the machine but actually may be running at something other than the intended operating size.

Then too, size has a direct relationship to tension. This means simply that each felt is designed to run at a prescribed length and width under a certain tension. We refer to this length as designed or intended running length. If the tension selected by the designer, is in excess of that which the papermaker is accustomed to running or in excess of the limits of the machine, then the felt will run short and wide and a host of difficulties may ensue.

Complicating the problem of tension is the fact that in a board mill, tension is often measured by feeling the felt by hand. It is not hard to understand, then, why it is sometimes difficult for a designer to select a tension which coincides with that desired by the mill. When a felt is running too short, usually a check will reveal that it was not pulled out to its designed length because the tension seemed right to the superintendent or machine tender long before that point was reached.

To avoid inaccurate evaluations of felt tension and operating length, we recommend accurate measurements at felt start-up and whenever any changes are made in a machine which may affect running length.

Felts should be run at designed length and tension

To understand the importance of running a felt at its designed length, width and tension, let us examine a section from a mock-up of a felt and see what happens to the weave under various conditions. In Fig. 1, the felt section appears as it would running at designed length and tension. Now let us assume the felt is being run short of its manufactured length because the designed tension is too high. As you can see in Fig. 2, the felt runs shorter. The filling threads draw closer together, which closes up the felt and prevents maximum drainage. Also, the felt will be wider than intended.

Some paper mill operators are reluctant to trim their felts when they are wider than desired. Instead they cock the blue lines or "throw the seam". This can result in a diagonal alignment of warp-filling crossovers (Fig. 3), which is sometimes termed "resultant wale". When this shows up on the finish of high-grade board, it is sometimes mistaken for a filling mark, although it actually is much coarser than a filling mark.

The angle of this wale mark across the sheet is determined by the degree of cock and the number of picks and ends per inch in the felt.

Note too, that the space between the warp and filling yarns has been considerably reduced. Cocking the felt, then has actually caused it to close up. The result can be poor drainage, possible premature filling-up of the felt, blowing or crushing of the sheet and ultimate loss of production and quality board.

Next, consider the case of a felt whose manufactured length exceeds the maximum the machine will accommodate. Admittedly this does not happen very often. To cite one example, though, a felt was designed some years ago for a machine which, according to measurements supplied by the mill, had a jack mid-point of 165-ft. and a felt width of 126 in. Accordingly, the felt was designed at this size.

After installation on the machine, it was reported as running too wide. Without taking measurements, the mill requested the width of the next felt be reduced 3 in. After this was done, the mill people were then satisfied with the width of the felt and the tension — according to their "feel" — was about right. Therefore it was assumed the felt was now fitted to the machine.

Later we received several complaints about crushing of the sheet. Our service engineer took measurements of the felt and found it was running at only 158 ft. in length. This explained the initial excessive width and also the crushing. Subsequent felts furnished in the correct running size eliminated the difficulties.

In this case, running at the shorter length, the weave of the felt was

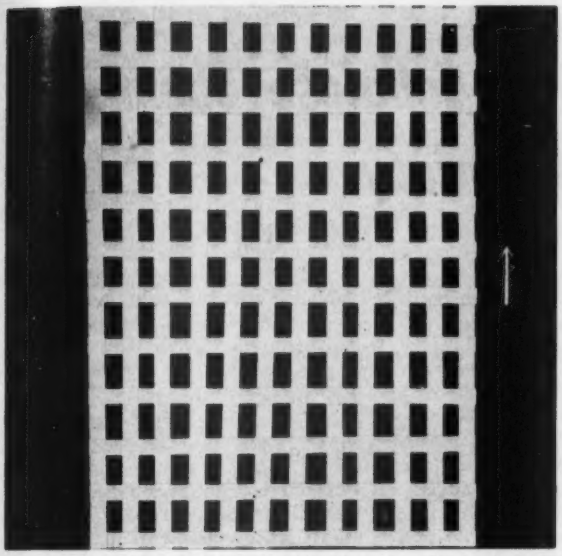


Fig. 1 — Mock-up of section of a felt which is running at designed length and tension.

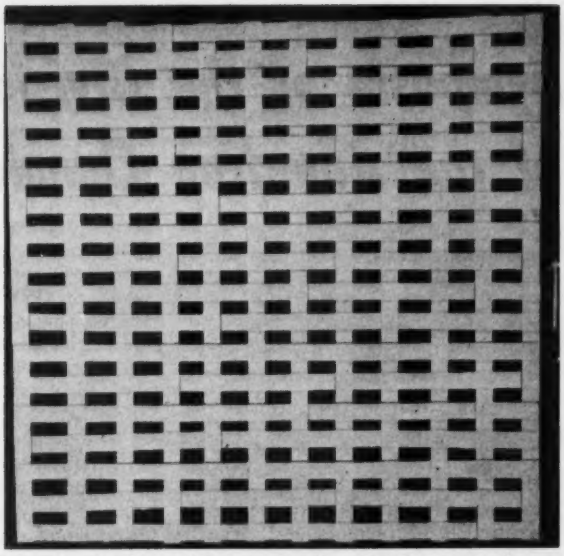


Fig. 2 — Mock-up of section of a felt which is running short of its manufactured length.

closer than it was designed to be. Fig. 1 shows the weave as it should have been at 165 ft. Fig. 2 shows the weave as it appeared running at 158 ft. It is not hard to understand why drainage was impaired with consequent crushing of the sheet and filling-up.

Under such conditions, it is not uncommon to receive complaints of felts "stretching". This is because the felt, although it runs initially at a satisfactory length, tends later in its life to elongate toward its designed length.

Adjustments of the jack roll can compensate for this to some extent, but if the manufactured length of the felt exceeds the maximum length of the machine, then obviously a point will be reached when the felt is slack and no further adjustments are possible.

In summary, for best finish, longest life and maximum efficiency, it is most important that a felt be run at its manufactured length and width. Any changes in the paper machine which affect its running length should immediately be brought to the attention of your felt sales engineer so that he can get a complete set of accurate measurements.

Then too, great care should be exercised to see that the guide lines on a felt are running straight and the felt is not cocked, bowed or otherwise pulled out of shape. Any such distortion will surely reduce the drainage and may affect the finish characteristics of the felt.

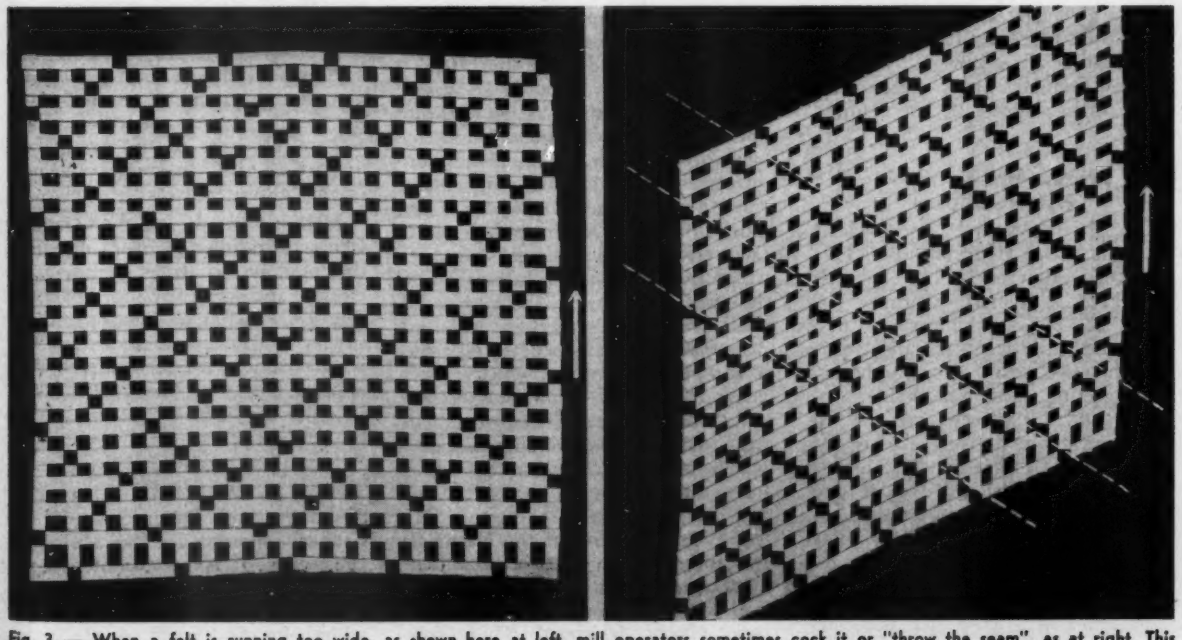


Fig. 3 — When a felt is running too wide, as shown here at left, mill operators sometimes cock it or "throw the seam", as at right. This results in a diagonal alignment of warp-filling crossovers — indicated by dotted white lines — known as "resultant wale."

Symposia of the Division of Cellulose Chemistry of the American Chemical Society

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The Institute of Paper Chemistry
Appleton, Wisconsin

THE 136th National Meeting of the American Chemical Society, held in Atlantic City, September 13-18, cannot be encompassed within a few pages. Twenty-two divisions met concomitantly. Well over 1000 papers were read, and at least 2,400 chemists or chemical engineers contributed to these articles. The total attendance exceeded 10,000, and a large number of foreign chemists were among the authors. Many who gave papers came from the various provinces of Canada, but scientists who also presented their work came from Belgium, Holland, Sweden, the U.S.S.R., Scotland, England, Germany, France, Ireland, Switzerland, Japan, India and Australia.

Thus there were important symposia in many fields, but this report will deal with only two of these, together with a sprinkling of other papers given before the Division of Cellulose Chemistry. It is interesting to note that about one half of these articles stemmed from laboratories other than those of the United States.

Symposium on Wood Hemicelluloses

The first of these symposia dealt with the **Wood Hemicelluloses.** This had been catalyzed by the energetic Dr. Tore E. Timell, honorary lecturer at McGill University, who began his activities in recruiting participants two years prior to the actual meeting. The remarkable program, and its success, can be ascribed in large measure to his enthusiasm and efficiency. The reader may ask "Why should a three day symposium be devoted to the hemicelluloses?" A somewhat similar question was asked thirty years ago, when the late William G. Campbell, then senior principal scientific officer of the British Forest Products Research Laboratory, argued with his Council regarding the advisability of studying the hemicelluloses. Often wood contained 20 to 25 per cent of these components, and Campbell felt that they required investigation. He had a hard time convincing his superiors—but finally he won the day. This resulted in the classical researches of Miss O'Dwyer.

In 1959, we know that the hemicelluloses (or substances resembling them) are often essential in making good paper. They induce hydration, effect better bonding, serve as adhesives, and, in general, improve the strength of the paper. We also know that in certain types of dissolving pulps (especially those used in making cellulose esters), the hemicelluloses are undesirable. In any event, they deserve and are receiving fundamental study throughout the civilized world.

After Dr. Timell's opening remarks, the first paper, dealing with **a Review of Studies on the Hemicelluloses** was given by L. E. Wise. Following this were talks dealing not only with the hemicelluloses, but with intensive original studies on certain related wood polysaccharides. Many of these are of direct or indirect interest to the pulp manufacturer, and even though this fact was only mentioned occasionally at the meeting, many of the species studied are woods used in pulping. A number of these papers fell into a certain pattern, in which three general types of wood polysaccharides were discussed. These included the water-soluble arabogalactans, which are not actually hemicelluloses, and the more important xylans and glucomannans.

Dr. G. A. Adams of the National Research Council, Ottawa, presented a scholarly report on the **Constitution of an Arabogalactan of Tamarack (Larix laricina).** Then followed a paper on the Isolation and Characterization of a Glucomannan from **Scots Pine,** given by Dr. Ingemar Croon, who worked with Dr. Hans Meier and Dr. Bengt Lindberg of the Swedish Forest Products Research Laboratory at Stockholm. After an exhaustive study, the belief was expressed that this, as well as other cell wall polysaccharides, may be linked to lignin. The **Constitution of Xylan from Sitka Spruce** was discussed by Professor G. G. S. Dutton, who with his collaborator, K. Hunt, carried out this work at the University of British Columbia.

Dr. Bengt G. Ranby of the State College of Forestry at Syracuse University, outlined the **Physical Properties of Wood Xylans and Glucomannans.** Ranby and his co-worker Karin Rosengren-Forsblad concluded that, in the main, hemicelluloses are dispersed physically in the cellular fibrillar framework; and that basic differences between purified wood cellulose and such fibers as cotton or ramie seem to be due not simply to the presence of residual hemicelluloses of the wood, but, in part at least, to modified groups in the cellulose chains themselves.

Methods used in the General Characterization and Proof of Structure of Polysaccharides was reviewed clearly and critically by Professor Roy L. Whistler of Purdue University, who also furnished examples in which useful newer techniques were applied. His presentation dealt largely with methods developed within the past six years.

Drs. D. A. I. Goring and T. E. Timell of McGill University and the Pulp and Paper Institute of Canada reported on the **Molecular Properties of some 4-O-Methylglucuronoxylans** isolated from four hardwoods: white and yellow birch, white elm, and sugar maple under very mild conditions. The average

number molecular weights were determined osmometrically and their weight-average molecular weights were derived from light scattering measurements of the free acids in dimethyl sulfoxide after ultracentrifugation. It is interesting to recall that this useful solvent is itself a by-product of the kraft pulping operation. This Canadian study showed that these four hemicelluloses had molecular weights that were somewhat higher than hitherto believed. The Phoenix-Brice light scattering apparatus used in this investigation was described.

In most structural studies on the hemicelluloses, these were isolated by an extraction with alkali. This removed acetyl groups, which however must be considered true units in these polysaccharides. To obviate this removal, in an interesting study on an **Acetylxylan from Birch,** H. O. Bouveng, P. J. Garegg and B. Lindberg used a technique that retained most of these groups. They prepared a reasonably pure glucuronxylan containing 17 per cent acetyl from a birch holocellulose by using dimethylsulfoxide; and in a comprehensive study showed that the xylan was the usual type found in hardwoods, and also that the acetyl groups were all present on the xylose residues. About 75 per cent occupied the third carbon atom in the xylose units. However they were cautious in stating that acyl migration was not completely excluded.

An interesting study on the **Catalytic Oxidation of the epsilon-Galactan from European Larch** was reported by Dr. G. O. Aspinall of the University of Edinburgh. This was work done together with Dr. A. Nicholson.

Professor J. K. N. Jones reported his work and that of Messrs. M. Abercrombie and R. J. Stoodley of Queens University, Kingston, Ontario, on the **Biosynthesis of Polysaccharides.** Admitting that practically nothing was known of the enzymic synthesis of polysaccharides usually found in commercial wood pulps, Dr. Jones by analogy with the mechanism of carbohydrate syntheses in micröorganisms, suggested possible routes by which wood polysaccharides might be produced in trees. Recent work on the origin of pento- and hexoglycans was discussed.

Dr. T. J. Painter, Atlantic Regional Laboratory of the (Canadian) National Research Council, Halifax, Nova Scotia, reported on the **Polysaccharides in White Spruce Inner Bark.** This work had been done in cooperation with Professor C. B. Purves of McGill University. From various bark extracts, by graded precipitation of copper complexes (and by other methods as well), five fractions of chemically separate groups of polysaccharides were obtained. These were explored by hydrolytic procedures, and three of them were examined by sedimentation, ionophoresis, methylation, and by partial enzymic hydrolysis. They presented three major differences from hemicelluloses normally found in the wood. The inner bark contained appreciable amounts of pectic material, starch and a xylan fraction that was practically free from 4-0-methylglucuronic acid units, which seem to be omnipresent in the wood xylans.

Researches on the Hemicelluloses of Maritime Pine, an important French pulpwood, were described by Dr. A. Roudier of the Institut National de Recherche Chimique Appliqué, in Paris. Dr. Roudier, over the years, has made effective contributions in this field. He discussed the possible structure of a xylan fraction with lateral units consisting of arabofuranose, 4-0-methylglucuronic acid and glucuronic acid. He also briefly outlined the role, in pulping, of certain fractions rich in uronic acid residues.

Other **Studies on Larch Arabogalactans** were discussed by Dr. H. O. Bouveng, who showed by electrophoresis on glass fiber sheets, that two different polysaccharides were present; these could be separated fractionally by means of cetyl trimethylammonium hydroxide-boric acid. Experiments dealing with their structure were described.

The Division of Applied Biology of the National Research Council, Ottawa, has been the scene of many important studies on fibrous plants, and the present one on a **Glucomannan from Jack Pine** was no exception. This was reported by Dr. C. T. Bishop and represented his work and that of F. P. Cooper. The purification of the carbohydrate was described carefully, and the authors obtained an electrophoretically homogeneous fraction containing glucose and mannose units in the ratio of 1 : 2, retaining only traces of galactose and xylose residues. The product was oxidized with periodate, reduced and hydrolyzed, giving glycerol and erythritol in the ratio of 1 : 21. These components after acetylation were determined by gas liquid partition chromatography. No free sugars were present. These results, together with methylation data, indicated the usual β-1-4 linked units in the polysaccharide, with possibly some branching in the 6-position.

Professor Jones took up the **Water-soluble Polysaccharides from Wood,** showing that often these were mixtures. This represented work done at Queens University by P. E. Reid, and involved the isolation, purification and structure of some of these carbohydrates, especially the polysaccharides from loblolly pine. **Some Polysaccharides present in Yellow and White Birch** were isolated by Drs. C. P. J. Glaudemans and T. E. Timell, and this work was reported by the latter. As usual, the principal hemicellulose was a 4-0-methylglucuronoxylan. However white birch also yielded a glucomannan, in which the ratio of glucose to mannose was 1 : 1.1. The wood also gave small amounts of water soluble extractives. The inner bark of the white birch, extracted with hot water gave appreciable amounts of pectic material, and subsequent alkaline extraction gave a mixture of polysaccharides.

One of the most interesting and provocative papers of the symposium dealt with the **Distribution of Polysaccharides in the Pinewood Tracheid.** It entailed extremely careful micromanipulations on the part of Dr. Hans Meier. His colleague, Dr. Lindberg, presented the paper. The young tracheids of Scots pine were fractionated into morphologically homogeneous layers, and fractions of a milligram of each of these were isolated. Miniature amounts of these tissues were hydrolyzed and the sugars determined quantitatively by chromatographic techniques. This was done both for spring and summerwood fibers. The following conclusions were reached: (a) pectic material is present largely in the middle lamella and the primary wall (which were isolated together); (b) the outer wall of the secondary layer has a polysaccharidic composition quite similar to that of the entire tracheid; (c) the middle layer of the secondary wall contains much glucomannan, but is low in xylan; and (d) the inner layer (near the lumen) contains over 50 per cent xylan. These findings are not entirely in harmony with some of the older hypotheses regarding polysaccharide distribution in the cell wall.

Another important paper given by Dr. Painter, in collaboration with Dr. Timell, involved the novel **Enzymatic Hydrolysis of a 4-0-Methylglucuronoxylan from White Birch.** This depends on the graded enzymic hydrolysis of polysaccharides within

a cellophane membrane bag, surrounded by a large volume of water. Thus the larger sugar molecules (the oligosaccharides), split off by the enzyme, can diffuse out of the bag before further hydrolysis occurs. In this way the hemicellulose from birch was submitted to graded hydrolysis by means of a *pectinase* and yielded two sets of polymer-homologous carbohydrates. One of these was a series of xylose oligosaccharides; the other gave a series of oligouronic acids. The overall combined yield accounted for 66 per cent of the entire hydrolyzate. A possible mechanism of the *pectinase* activity was discussed, and the method may form an important advance in studying the structure of wood hemicelluloses. A possible side reaction however should be kept at a minimum. The *pectinase* gradually also attacks the cellophane bag itself. As Dr. Timell remarked: "One must get to the laboratory early on the 8th day of the hydrolysis, otherwise the bag may be ruptured and the experiment spoiled".

At this point, the symposium took a course away from purely basic organic-chemical studies to those having a closer bearing on the commercial importance of the hemicelluloses. Thus, R. W. Collier, of Buckeye Cellulose Corporation in Memphis, discussed his work on the **Kinetics of the Alkaline Degradation of Hemicelluloses at Pulping Temperatures.** A partially prehydrolyzed kraft pulp, which still retained appreciable amounts of hemicellulosic material, was used and degraded in 7 per cent and 10 per cent sodium hydroxide solutions at 160° and 180° C. It was found that the acid precipitable material (β-cellulose) decreased linearly with the time of heating. This was described as a pseudo-zero-order reaction, because the degradation rate was dependent on the initial β-cellulose concentration. Kinetic data are in accord with the stepwise end-degradation whereby the reducing end group is removed and converted into a saccharinic acid salt, leaving a newly formed reducing group on the main chain. This reacts further, and so the stepwise removal continues. Mr. Collier believes that this is the first instance in which the kinetics of the alkaline degradation of a polysaccharide has been reported. His work furnishes experimental evidence that the β-cellulose destruction occurs under the usual alkaline pulping conditions. Activation energies and specific rate constants were calculated for the two concentrations of sodium hydroxide used in the study.

Some Aspects of Hot Alkali Refining of Pulp were presented by Olof Theander giving his work and that of Anders Assarsson and Professor L. Stockman of the Swedish Forest Products Research Institute in Stockholm. Effects of chlorite oxidation and also of borohydride reduction on the normal hot alkaline refining were described. Apparently the borohydride reduction could be carried out concomitantly with the alkaline treatment. These techniques decreased pulp losses and, especially in the case of chlorite oxidation, improved the degree of refining. The chemical compositions and the properties of the various experimental pulps were also investigated.

From the Billeruds Research Laboratory, Säffle, Sweden, came a paper on the **Behavior of Hemicelluloses during Sulfite Pulping.** This was the work of G. E. Annergren and Sven A. Rydholm and was presented by the latter. When a neutral cooking stage preceded the normal acid sulfite digestion, rayon pulps were formed that were lower in α-cellulose than those obtained in a one-stage digestion. This effect was attributed to the pH of the initial stage. The low α-pulps contained less xylan but more glucomannan, and an hypothesis was offered to explain the inaccessibility of the latter. Apparently in a normal sulfite cook, little so-called "stabilization" of the glucomannan occurs, unless the digestion is preceded by long impregnation at relatively low temperatures. However, crystallizable glucomannan fragments obtained even after short impregnation periods, as shown by carrying out sulfite cooks in the presence of cotton linters. Both spruce and pine but not birch showed this glucomannan behavior.

Dr. J. Neal of Industrial Cellulose Research Ltd., Hawksbury, Canada, outlined his work and that of his colleagues W. Kitchen, A. Schavo, and H. Krässig on **Factors Influencing the Solution Properties of Cellulose Acetates from Wood Pulp.** Dilute solutions of the acetates (degree of substitution, 2.5) were centrifuged to remove the gel-forming components. Hydrolysis and paper chromatograms, both of the sediments and the initial acetates, showed enrichment of acetates of the gluco-mannans and xylan in the sediments. Rheological and turbidity studies of solutions of the original acetate and the purified products recovered from supernatant solutions, indicated that gel removal caused a reduction in the non-Newtonian flow behavior and in turbidity. In some instances the properties of cotton linter acetates could be simulated. Chloroform extracted the more highly substituted acetates as well as a large portion of the glucomannan acetate fraction and the removal of these less-polar components reduced the non-Newtonian flow character without, however, achieving much improvement in turbidity or color. Solubility studies on sediments showed that the mannan acetates had a greater affinity for the less polar solvents whereas the xylan acetates showed a greater solubility in solvents that were more polar than acetone.

Dr. R. H. Marchessault and R. S. Screaton of the American Viscose Corp. gave a joint paper on the **Effect of Hemicelluloses on the Heat of Wetting and Moisture Regain of Wood Pulps,** which had varying α-cellulose contents. The effects of the hemicelluloses were compared with the effects of crystallinity and inaccessibility in the case of cellulose. The moisture regain of a variety of hemicelluloses was measured and this magnitude correlated with x-ray diffraction diagrams of these materials. The changes in moisture regain of a spruce holocellulose, as hemicelluloses were removed, were also discussed.

Dr. Whistler and his co-workers R. Schweiger and A. M. Belfort gave a report on the **Oxidation of Xylan and other Cell-Wall Polysaccharides at Different Hydrogen-Ion Concentrations** by hypochlorite solutions. At all pH levels, the hydrolysis of oxidized xylan gave carbon dioxide, D-xylose and glyceric acid. Mannans were not readily oxidized.

Some Hemicellulose Components of European Woods were described by Dr. Aspinall, together with a review of structural studies on various water-soluble polysaccharides and hemicellulose fractions from beech, oak, spruce, larch and Scots pine, as well as Sitka spruce. The final paper of this three day international symposium showed, in full detail, some extremely difficult and ingenious studies on the **Synthesis of β-(1→2)-linked Disaccharides related to Wood Hemicelluloses,** undertaken by Dr. W. D. S. Bowering and by Dr. Timell, and presented by the latter. Three disaccharides were prepared, all of which were related to those obtained on wood hydrolysis. In two cases they were anomers of the two aldobiouronic acids often obtained from wood hemicelluloses.

(To be continued in the next issue).

Falls Paper & Power wins Fritz Trophy second straight year

G. L. Heath (right), plant manager of Falls Paper & Power receives the 1958 Edward Benton Fritz Memorial Trophy for his company from A. Scott Dowd, president of Fritz Publications Inc.

Keeping the safety program fresh and alive—creates a safety-conscious attitude

ON OCTOBER 22, Falls Paper & Power Co. again added another mark of achievement to its oustanding safety history. The company received for the second straight year, the Edward Benton Fritz Memorial Trophy.

This memorial trophy is presented annually by Fritz Publications Inc., publisher of THE PAPER INDUSTRY, to give national recognition to that mill which in the opinion of the judges has made the most outstanding record during the preceding contest year.

OCONTO FALLS RECORD

Year	Lost-Time Injuries	Days Lost	Frequency	Severity
1951	23	6,402	31.6	8.79
1952	3	690	4.07	.94
1953	0	0	0	0
1954	4	788	5.15	1.02
1955	2	404	2.44	493.8*
1956	0	0	0	0
1957	0	0	0	0
1958	0	0	0	0

*In 1955 the basis for the measurement of severity was changed from 1000 man-hours to correspond with the standard measurement for frequency.

Employees at Falls Paper & Power are proud not only for this national recognition, but also proud of their safety-conscious efforts that resulted in this recognition. It is of course true that the achievements that have come to Falls Paper & Power have added to the safety consciousness of all employees. But, it must also be remembered that this consciousness had to be created before the first achievement could be made.

Falls Paper & Power is a wholly owned subsidiary of Scott Paper Co. and is located in Oconto Falls, Wis. The mill, a fully integrated pulp and paper making mill, employs approximately 320 people, and operates a sulfite pulp mill equipped with two fourdrinier paper machines and a converting department manufacturing household, and industrial paper towels and household wax paper.

The company initiated its first all-out safety program in the summer of 1951. In its first year, the number of lost time injuries suffered by the people of the plant was reduced from 23 in 1951 to only 3 in 1952.

The basic elements used in this program are quite ordinary in other mills, but as always, it takes effort to maintain the program's freshness and Falls Paper & Power is continuing to do this.

The following two pages present an outline of the safety program used at Falls Paper & Power.

How the Oconto Program Functions

Plant Committees

■ **Departmental Safety Committees** consisting of a supervisor as chairman and hourly employees from the various departments of the mill. These committees meet on a monthly basis, minutes are kept on points covered during the meetings and are used as a guide for corrective safety action and for follow-up as required.

■ **Accident Investigation Committees,** consisting of division head, safety committee chairman, personnel manager, plant nurse and immediate supervisor, meet to investigate all lost-time injuries or serious near-misses.

■ **Executive Safety Committee** consisting of plant manager, plant staff and plant nurse who meet at the call of the personnel manager whenever deemed necessary.

■ **Good Millkeeping Committee** consisting of plant manager, production manager, production planner and department head concerned who make periodic inspections.

Mill inspections

■ Periodic inspections by fire insurance carriers make complete checkout of entire fire system several times per year. Recommendations for corrections or additional measures as appropriate.

■ Periodic inspections by compensation carrier — safety engineer from Employes Mutual visits, inspects and counsels almost every month. Special consultations as required regarding increased or new hazards.

■ Annual inspection by Scott staff insurance department —representatives of Corporate Insurance department make thorough inspection with insurance carriers to insure maximum compliance with safe practices.

■ Weekly inspections of all fire facilities by maintenance department — checked during this inspection are: seals on all fire extinguishers, water and air pressure in all fire lines, water level in water tower, proper functioning of all fire system pumps, availability of an access to fire hoses, placement of gas masks and freshness of canisters, operation of fire doors and thoroughness of watchmen's rounds.

■ Daily check and inspection of mill by watchmen — watchmen make hourly rounds clocking in stations from 6:00 p.m. to 6:00 a.m. seven days a week or 24 hr. per day during the time when the mill is not operating. In addition to staying on the alert for fires, intruders or other unusual situations, the watchmen also check critical pressure and temperature gauges in the fire and wax heating systems.

■ Periodic inspections by the boiler and machinery insurance carrier — each year a complete internal and external inspection is made of all boilers and digestors. Other non-fired pressure vessels are inspected externally. Inspections are made of all paper machine dryers, chipper disks, line shaft pulleys and electric transformers. Steam turbines are run up and operated at full speed; overspeed safety trips are also tested.

■ Inspections by State Industrial Commission — annual inspection by Commission agent to check compliance with state industrial code.

Medical program

■ Services of two on-call doctors — there are two local doctors and both are on retainer by the mill. Each spends some time at the mill each week giving physical exams and checking sick and injured employees. During hours when the nurse is not in the first aid office, foremen are required to give an authorization for doctor's service to any employee who requires medical attention due to plant injury. Employees requiring immediate medical attention are taken to the doctor or to the local hospital for diagnosis and treatment as required.

■ Full time industrial nurse — a graduate registered nurse is on duty during office hours (7:30 a.m. to 4:00 p.m.) five days per week. Visitations are also made as needed to employees confined in the home or hospital.

■ Regular physical examination of all employees — employees are scheduled for regular physical examinations every year or two depending on age and previous health record. Further examinations are made as required.

Dorothy White, company nurse, checks blood pressure of patient Laverne Cisler. Nurse is on duty during regular office hours.

G. L. Heath, plant manager, discusses accident report with foreman Dario Ama. Written reports of all accidents must be on plant manager's desk (carbon copies to first aid and department head) by the end of the shift during which the accident occurs.

■ Well-equipped first aid department — first aid equipment includes: two rooms (receiving and examination rooms), all necessary sanitary facilities, portable oxygen resuscitator, all necessary drugs for treating common ailments, infra-red lamp, etc.

■ Three first aid stations at key spots in the mill — first aid stations are stocked with dressings, aspirin, eye wash, ammonia ampules, tourniquet and antiseptics.

Publicity

■ Literature circulated to safety committees. The following literature is regularly circulated among the safety committee personnel: *Occupational Hazards; Safety Maintenance; National Safety News; The Paper Industry; Health; Industrial Supervisor; Formen,* etc. In addition, each employee receives a copy of *Safe Worker* monthly.

■ Posters, as supplied each month from overall Scott program are prominently displayed. Posters from the National Safety Council are also displayed on a regular basis.

■ Safety reminders on weekly pay checks — each pay stub is imprinted "Safe days make full pays" in large red letters.

■ Monthly safety bulletin from Scott, circulated to and analyzed by division heads — this reports monthly on lost time injuries and safety statistics from all Scott mills. Also included with this report are disability reports circulated by the American Paper & Pulp Association.

■ Safety displays — shadow box, symbols, etc. Awards from Scott Inter-Plant Safety Contest, Fritz Award, National Safety Council and Insurance carriers are displayed.

Reports

■ Accident report is made out by immediate supervisor on all accidents. These reports are reviewed by department head, personnel manager and plant nurse. Follow-up is done where required.

■ Monthly report to Scott Headquarters on all lost-time injuries and monthly manhours worked.

■ Report of all injuries referred to doctor is submitted to compensation carrier.

■ Report to Scott Paper Insurance Department on all significant plant equipment failures.

■ Review of first aid treatments by personnel manager.

Annual safety banquet

■ Attending this banquet are: the outgoing safety committee consisting of 22 members; the new safety committee consisting of 20 members — pulp and pulp prep (6), finishing (4), paper mill (3), traffic (2), and engineering and maintenance (5); all mill supervisors; guests, including community representatives; representatives of Employers Mutual Insurance (awards); gifts are usually given to outgoing safety committee. A safety talk is given by the plant manager.

Miscellaneous

■ Safety and housekeeping suggestions may be financially rewarded through the Scott Paper Co. suggestion system.

■ Major capital installations are finally reviewed for safety implications before operation starts.

■ Cost of safety equipment and modifications to existing plant facilities is budgeted in all departments and administered by each department head.

A safety award for over 3,000,000 safe manhours is being presented to Gib Wendt, foreman and chairman of the converting safety committee, by Paul C. Baldwin, Scott vice president, and Miss Dorothy Voltz of Employers Mutuals of Wausau.

Paul C. Baldwin presenting Robert Morrow, paper mill foreman and chairman of the departmental safety committee, with a plaque certifying that Falls Paper & Power Co. was the Group C winner in the Pulp and Paper Mill Division of the National Safety Council's 1958 Paper Industry Safety Contest.

Three Scott Paper Co. plants were honored for perfect safety records during 1958 at the firm's annual safety banquet. Paul C. Baldwin, vice president, presented the Scott achievement plaque to plant representatives Andy Demkowitz, Madison; Dorothy White, Oconto Falls; and Roy Provancher, Marinette.

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CARELESSNESS, THOUGHTLESSNESS AND THE IDOLATRY OF SPEED is causing our nation to shed blood and tears.

This was the onset made on the delegates attending the opening meeting of the Pulp and Paper Section during the 47th Safety Congress held at the Conrad Hilton Hotel in Chicago, October 19-23.

Adding to this statement, Harry H. Saunders, vice president of St. Joe Paper Co., said: "Just because our civilization was built on blood and tears is no reason why we have to operate it on blood and tears. We are doing this — all without adding one iota of progress to our civilization".

Most of us are willing to try most anything to improve our safety record, he told the delegates, but where is this going to lead us and how long will these methods continue to be of value? Maybe the time has come to turn our thinking toward things along the more fundamental lines.

Saunders demanded that we accept the new challenge — "Safety in the Sixties" — and operate our civilization in the "Sixties" without blood and without tears.

With this same concern, Henri M. Aldridge, general counselor of Southern Kraft Division, International Paper Co., told the delegates that we are moving at a speed too fast to enjoy the things life has to offer — the things we should stop to enjoy, learn and understand. Friendliness, thoughtfulness and gracious living, Aldridge claims, seems to belong to the past due to our present rate of speed. We can reach a point where we are going too fast to know what we are fighting for.

Keynote address at the opening meeting of the Pulp and Paper Section was given by Harry H. Saunders, vice president of St. Joe Paper Co.

Guest speaker at the joint luncheon was Henri M. Aldridge, general counselor at the Southern Kraft Division of International Paper Co.

Falls Paper and Champion Paper win national recognition

The annual joint luncheon with the wood products section and the pulp and paper section was highlighted with the presentation of the national awards — the Edward Benton Fritz Memorial Trophy and the Arthur Hoyt Scott Award. These major awards were given for the outstanding safety achievement during the 1958 safety contest year.

Falls Paper & Power Co. won, for the second straight year, the Fritz Memorial Trophy. This trophy is presented each year by Fritz Publications Inc., publisher of THE PAPER INDUSTRY, to give national recognition to the mill which has made the most outstanding safety record during the contest year.

Falls Paper & Power Co. is a subsidiary of Scott Paper Co. and is located in Oconto Falls, Wis. For the 1958 contest year, Falls Paper had completed a total of 3,143,940 safe man-hours that continued through December 31, 1958. G. L. Heath, vice president and general manager, was present to accept this award for his company.

Champion Paper & Fibre Co. was unanimously chosen as the winner of the 1958 Arthur Hoyt Scott Award. This award is presented each year by Scott Paper Co. to the company, all of whose mills combined, has achieved the best safety performance during the contest year. Karl R. Bendetsen was present to receive this award for his company.

Industry report

The following statistical report was presented by A. Scott Dowd, chairman of the contest committee.

Among the 40 industries reporting their accident experience to the National Safety Council for the 1958 contest, Pulp and Paper ranked 21st with a frequency of 6.97. This is slightly higher than the average 6.17 for all industries.

In the Paper Industry Safety Contest, 654 participants finished the 1958 competition — 321 in the pulp and paper mills, 317 in converting plants and 16 in pulpwood logging units. The total exposure was 574,822,000 man-hours. There were 4,390 reported injuries. This was a decrease of 19 per cent.

The final combined frequency rate (excluding pulpwood logging) was 7.01. This was one per cent lower than in 1957, and again, the lowest combined frequency rate that has been reached in this industry in its record of 34 annual contests.

The cumulative rate of pulpwood logging was 35.84 — a decrease by identical units of 54 per cent compared with 1957.

Labor looks at safety

"Although basic aims of labor in safety programs or basic methods of approach in order to accomplish these aims do not change, there are enough new developments in papermaking equipment and processing to necessitate a new approach to some of the problems of safety" said John W. Shank Jr., International representative, International Brotherhood of Pulp, Sulfite & Paper Mill Workers.

Shank added that changes brought about in social and economic conditions of workers by labor-management negotiations sometimes necessitates a new look at safety programs. When industrial development in the United States was in its infancy, it was taken for granted that workers would have injuries and would probably be killed as a result of accidents. Quite a few changes in attitude have taken place since that time.

Any safety program, to be effective, must have the cooperation of union participation at all levels. Employees, Shank continued, must completely accept the responsibility of safety in elimination of accidents in order to procure good over-all end results.

The personal touch

Robert D. Gidel, Chief Division, Safety Standards & Services, Bureau of Labor, opened the second-day session by telling the attending members that to make the most impact with the limited facilities available, "you must personalize your approach and tactics to the situation or persons to be reached and impressed".

Gidel listed seven points to remember in preventing industrial injuries — personalize to the boss; personalize to the employee; personalize to the job; personalize to the family; personalize to the community; personalize to the union; and personalize to your responsibilities.

Personalizing takes imagination, ingenuity and talent. The individual must be reached by current thinking; this can be done by keeping yourself up to date with current thinking. Always keep one jump ahead of industry developments. How well you personalize your program, will greatly determine your overall success average.

G. L. Heath, Falls Paper & Power (right) receives Edward Benton Fritz Memorial Trophy from A. S. Dowd, Fritz Publications Inc.

Claire L. Lyon of Scott Paper Co. (left) presents Scott Award to Karl R. Bendetsen of Champion Paper & Fibre.

Important fundamentals

In his message, "Relationship of Training to Safety", J. E. Monaghan, training consultant for Bemis Bro. Bag Co., outlined a few important fundamentals to remember in keeping the safety program alive.

The first point stated was the importance of a wide range of interest within an organization — enthusiasm and action must start at the top and be carried down to the employee. Job instructor training should be given to the supervisor. Sometimes our training programs break down because we stop at too high a level because we think that the job is too simple and assume that the employee knows how. Each employee is different and we must adjust our training to them.

Early assessment of attitudes was the second point. If attitudes need to be changed, it is important that they be changed quickly. If the supervisor overlooks problems of attitude, they are apt to affect others in the department. His example, be it good or bad, is more impressive than safety posters or other gimmicks.

Point three deals with the early eradication of undesirable habits. This is important for the following reasons: (1) Bad habits may be unconscious and their repetition reinforces them; (2) Habits can be changed, influenced, or corrected; and (3) Desirable habits result from proper training. Desirable work habits must be observed in the early employment period of the employee. If his habits are undesirable, correct them now and check his progress. If there are no signs of improvement in a fair period of time, then the employee should be transferred.

The last point is that of proper selection and placement of an employee. Placement must be on the basis of previous experience, ability and aptitude. If the safety or training men find that a man has been misplaced, this should be called to the attention of management.

From left to right are the 1959-60 section officers. G. R. Merriman of International Paper Co. (General Chairman); D. V. Hill of Mead Corp. (Vice Chairman); V. P. Coulan of Sealright-Oswego Falls Corp. (Newsletter Editor); and Robert J. Gell of Eastman Kodak Co. (Secretary).

1959-60 Officers

Among the principal officers of the Pulp & Paper Section for 1959-60 (in addition to those pictured above) are:

Regional Representatives: Francis H. Wagner, Mead Corp. (*Chairman*); Arthur Carle, Northwest Paper Co. (*Lake States*); H. J. Hahn, Hammermill Paper Co. (*Middle Atlantic*); Dallas E. Henry, Continental Can Co. Inc. (*Southern*); Douglas B. Chant, Ontario Pulp & Papermakers' Safety Assn. (*Canada*); H. E. Newbury, Ecusta Paper Div., Olin Mathieson Chemical Corp. (*Central*); Earl F. Ripstra, Container Corp. of America (*Midwest*); Dan Adair, Pacific Coast Assn. of Pulp & Paper Manufacturers (*Pacific Coast*); R. G. Belknap, Bemis Bro. Bag Co., (*New England*).

Committee Chairmen: A. Scott Dowd, Fritz Publications Inc. (*Contest*); E. C. Cordon, Louisiana Forestry Commission (*Pulpwood Logging*); Robert M. Gilmore, Rayonier Inc. (*Pulp Manufacturing*); Merlin C. Race, St. Regis Paper Co. (*Paper Manufacturing*); Harold Hewitt, Bemis Bro. Bag Co. (*Bag*); Gordon B. Lemke, Employees Mutuals of Wausau (*Special Projects*); Leo M. Shaw, General Foods Corp. (*Off the Job Safety*); H. R. Mesier Jr., Ruberiod Co. (*Roofing*); Budwin J. Lee, Wood Conversion Co. (*Insulation*); Harold E. Tebo, Eastman Kodak Co. (*Specialties*); Jack Dunman, Mengel Co. (*Shipping Containers*); and Karl F. Simpson Jr., Folding Paper Box Assn. of America (*Folding Carton*).

R. G. Belknap (left), retiring Section Chairman receives recognition for his contribution to mill safety. Presenting this plaque to Belknap is Francis H. Wagner, Regional Representatives Chairman.

Three speakers seated left to right are: Dan Adair, Pacific Coast Association of Pulp & Paper Manufacturers; Forest E. Kimmell, Sutherland Paper Co.; and Robert D. Gidel, U. S. Dept. of Labor.

PERFECT FIT

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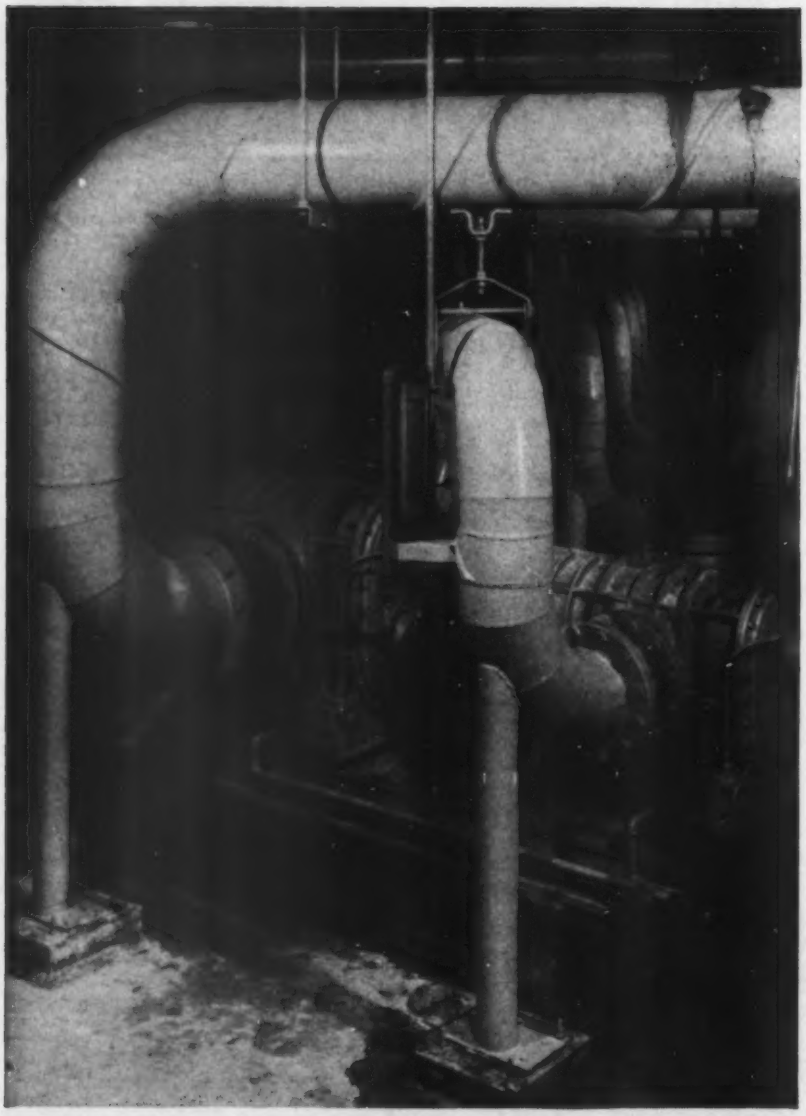

NAYLOR fits into your piping picture with lightweight Spiralweld pipe, standard fittings, and special fabrications.

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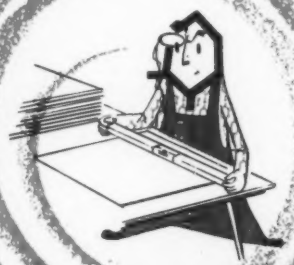

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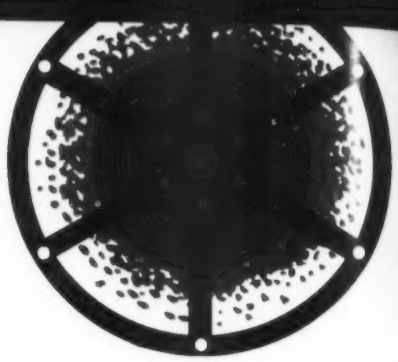

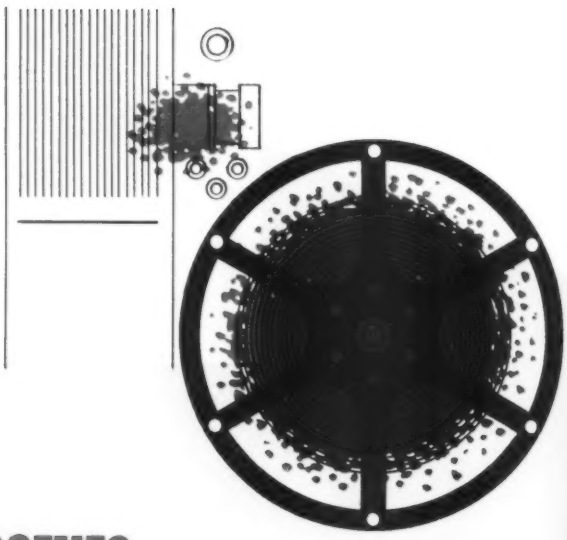

SCENES FROM ALICEVILLE

1. Portion of general administrative offices at Huyck Felt Company's Aliceville, Alabama plant.

2. Batteries of modern feltmaking looms capable of weaving the widest felts in use today.

3. Skilled operators joining woven fabric into endless belts.

4. Burling room showing spacious, well-lighted work areas where felts are painstakingly checked before finishing.

5. Several of the large instrument-controlled rotary fulling mills used to give felts proper size and body.

6. Five of the automatically operated stainless steel washers employed to insure cleanliness and apply chemical treatments.

7. View of the drying room where felts are dried under tension to insure proper size for installation and start-up.

PAPER'S MAGIC CARPET

The world's largest modern mill producing papermakers' felts — Aliceville, Alabama.

From Aliceville, Alabama, home of the world's largest, modern felt plant comes "Paper's Magic Carpet" — the Huyck-produced sound color motion picture on feltmaking every papermaker will want to see.

Via "Paper's Magic Carpet" you will tour incomparable feltmaking facilities and learn how new techniques and progressively-engineered equipment are combined by skilled craftsmen to produce the finest in felts. You will see in this educational film not only the entire feltmaking process, but many of the latest advancements in papermaking.

"Paper's Magic Carpet" is available for showing at your mill by your Huyck Sales and Field Service Engineers. Make your arrangements with them now.

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PANY
959

DOW | COATINGS

Paper maker tries Latex for "size"

...finds new adhesive permits higher solids content in coatings

In search of a better adhesive for their pigmented size press coatings, a nationally known manufacturer of coated and uncoated paper found the answer in low-cost Dow Latex. Here's their success story!

Modifying their original formula—an all-starch adhesive—with a percentage of Dow Latex, they were able to produce a binder with a lower viscosity. This permitted them to revise their coating formulation to allow for a higher solids content.

The results were gratifying: heavier coatings with better coverage, better printing quality. And the presence of latex in the formula gives the coating unique advantages . . . greater flexibility . . . better water resistance . . . easier calendering . . . higher gloss.

In much the same manner, Dow Latex can give your paper products a quality boost. It's certainly worth investigating . . . contact your nearest Dow Sales Office for more details. Or write THE DOW CHEMICAL COMPANY, Dept. 2322DN11, Midland, Michigan, for complete technical information.

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BOOSTS QUALITY
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(By What It Saves You In Repair And Replacement Costs)

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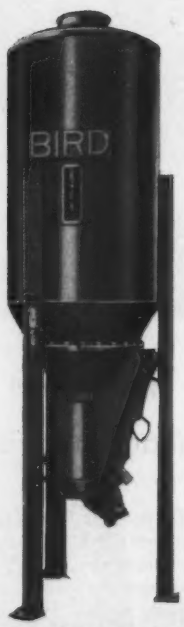

Junk and dirt is caught and removed from the stock as it comes from the pulpers, before it gets broken up into fine particles and before it does damage to pumps, wires, felts, knives or other costly equipment.

Centrifflers operate from low head pumps, gravity flow or 60 lb. inlet pressure for direct delivery to Cycleans or Dirtecs. Dirt removed may be quick acting manual or automatic dumping device.

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BIRD MACHINE'S 50th YEAR OF SERVICE TO INDUSTRY

CURRENT COMMENTS

Sharing forest areas — GATT conference postponed — world-wide consultation

Popularizing forestry by opening paper companies' forest areas to fishermen, hunters and recreationists is becoming an accepted feature of the industry's great forestry program. The importance of forest conservation will be better appreciated by the public when it is given access to the recreational facilities thus provided. The extent to which this program is being quietly developed can be realized by a partial listing of the great areas which are open to sportsmen.

WARREN B. BULLOCK

Coosa River Newsprint Co. of Coosa River, Ala., operates a picnic and camping area with hunting permitted to those holding written permits. One tract of 27,000 acres is a government game management reservation.

Simpson Logging Co., of which the former Everett, Wash., paper mill is a subsidiary, provides corridors along the streams in its Pacific northwest land to accommodate fishermen.

Hammermill Paper Co. allows hunting and fishing on its 136,000 acres of timberland in northeastern Pennsylvania and western New York.

Weyerhaeuser Timber Co. with its many papermaking subsidiaries maintains over 20 free public parks in western Oregon and Washington and permits free public hunting on most of its free farm acreage.

Champion Paper & Fibre Co. permits use of its forest lands in North and South Carolina and Texas with the provision that hunters and fishermen use care to prevent forest fires.

Rayonier Inc. provides recreational facilities on all of its vast holdings in Florida, Georgia and Washington.

Scott Paper Co. has built its entire forestry program on the thesis that recreational use of timberland is compatible with industrial utilization. The company recently gave a tract in the Moosehead Lake region to the state of Maine as a state park.

Conference postponed

The series of Customs unions being formed in various parts of the world will necessitate postponement of nearly a year, on the proposed GATT world conference for reciprocal reduction of tariff rates originally expected to begin early in 1960. The first of a series of preliminary conferences is now scheduled to open in September, 1960, when an effort will be made to reconcile the tariff adjustments involved in the formation of the European Common Market.

Four months have been set aside for these conferences and it will not be possible to begin the actual GATT tariff negotiations until January, 1961. Consequently any duty-rate reductions will not be effective until early 1962.

While Europe is completing details of procedure for both the European Common Market (six nations) and Uniscan (outer seven nations), a conference in Montevideo has taken the first steps toward the formation of a Latin-American tariff union to include Argentina, Brazil, Bolivia, Chile, Peru, Paraguay and Uruguay.

A crucial problem involving paper and paperboard is troubling Britain, Switzerland and Austria. These three countries have asked their governments to postpone cutting tariffs on paper within the "outer seven" area until an agreement on this point has been reached with the European Common Market. The three complaining nations sell paper and paper products chiefly within the European Common Market, while Scandinavia, itself a member of the "outer seven" sells chiefly to the area of which it is a member. Meanwhile all that the United States can do is to sit by and watch its European competitors try to solve their mutual difficulties — after which this country will have to do the best it can with the part of the market which remains.

The possible impact of the customs union programs on United States industry will be given an on-the-spot survey by a three-man, sub-committee of the House of Representatives Foreign Affairs Committee.

Future Prospects

A world-wide consultation on problems of future paper production and demand was held in Rome in September and early October. Both the Canadian and United States paper industries were represented by officials of their respective associations. The conference under the auspices of the Food & Agriculture Organization of the United Nations was scheduled to review current supply and trade trends and to appraise future prospects in world demand for pulp and paper. The conference is expected to provide a guide for the best utilization of the world's forests and the development of forest products industries.

Financial report

Despite the depressed prices for Wall Street securities resulting from the pessimism due to the steel strike, paper mill common stocks were often higher than a month ago. Preferred stocks, however, were generally lower, possibly due to the attractive offering of Government 5 per cent long term notes.

Mergers and Acquisitions

● An agreement in principle has been reached for possible merger of the KVP Co. and the Sutherland Paper Co. The combined resources of the two companies will make further growth possible. The products of the two companies complement each other and the geographical distribution of the plants owned by two companies will aid in serving customers. The scope of operations will extend from the woodlands in northern Canada through the manufacture of a high-strength, high-brightness pulp to paper and paperboard machines and then to converting plants strategically located to serve customers.

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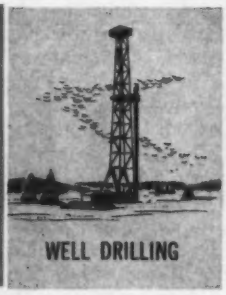

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LAYNE ASSOCIATE COMPANIES THROUGHOUT THE WORLD

Current Comments . . .

● Johns-Manville Corp. has announced the acquisition of F. E. Schundler & Co. Inc. of Joliet, Ill. The Schundler company is engaged principally in the production and processing of crude perlite. A. R. Fisher, chairman and president of Johns-Manville, stated: "Our principal reason for this acquisition is to add a new raw material to the Johns-Manville list of raw materials which now includes asbestos fiber, diatomite, wood fibers and glass fibers.

● St. Regis Paper Co. will operate Chemical Packaging Corp., which it recently acquired, as a subsidiary specializing in the sale of multiwall bags and packaging equipment to the fertilizer industry east of the Mississippi River. Richard Heard will continue in his present capacity as president of Chemical Packaging.

● A vote of approval has been made for the proposed merger of Flintkote Co. and Calaveras Cement Co. Calaveras Cement will become a division of Flintkote under the merger terms. This is the eleventh acquisition by Flintkote since it announced in February 1956 plans for a modern expansion and diversification program.

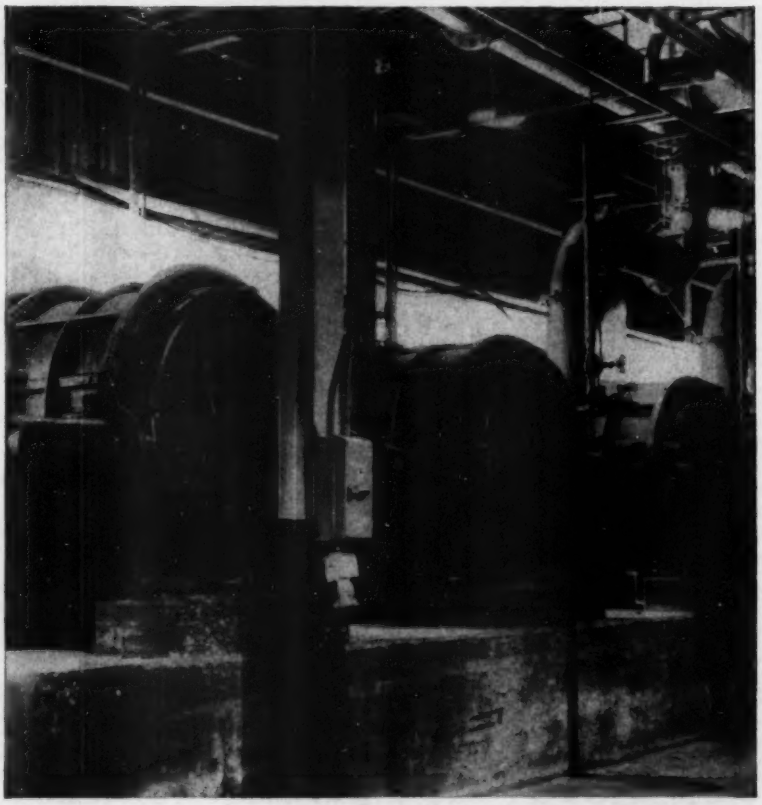
● The shareholders of Powell River have approved terms of a merger with MacMillan & Bloedel Ltd., including a two-for-one stock split. If sufficient number of MacMillan & Bloedel shareholders will accept the offer, steps may be taken to consummate the merger any time after November 16. A great number have already indicated that they favor the merger.

● Stora Kopparbergs Bergslags A/B, Falum, Sweden, and Scott Paper Co. of Chester, Penn., are to be joint owners of the recently-formed Nova Scotia Pulp Ltd. The Nova Scotia Pulp Ltd. began construction in July of a new pulp mill on a site located approximately two miles from Port Hawkesbury, Nova Scotia on the Canso Straits. The mill is scheduled for start-up in early 1962 and will have a capacity of 350 tons of bleached sulfite pulp. The company has been licensed to use the new two-stage pulping and liquor recovery process developed by Stora.

● Richmond Container Corp. of Richmond, Va., has been purchased by the Albemarle Paper Co. It will now be a wholly owned subsidiary of Albemarle. Richmond, incorporated in 1954, employs 60 workers and has

(Continued on page 582)

What, actually, do Vacuum Pumps on paper machines handle?



Paper mill engineers know that it is actually a mixture of air and water vapor, but the custom of rating vacuum pumps in terms of air capacity alone causes this important fact to be frequently overlooked.

The presence of this water vapor causes a considerable reduction of the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump the bulk of this water vapor is effectively condensed, due to the Nash operating principle. The air handling capacity of the Nash is therefore not reduced.

That is one of the reasons why Nash Vacuum Pumps are standard in over a thousand leading Paper Mills.

NASH ENGINEERING COMPANY

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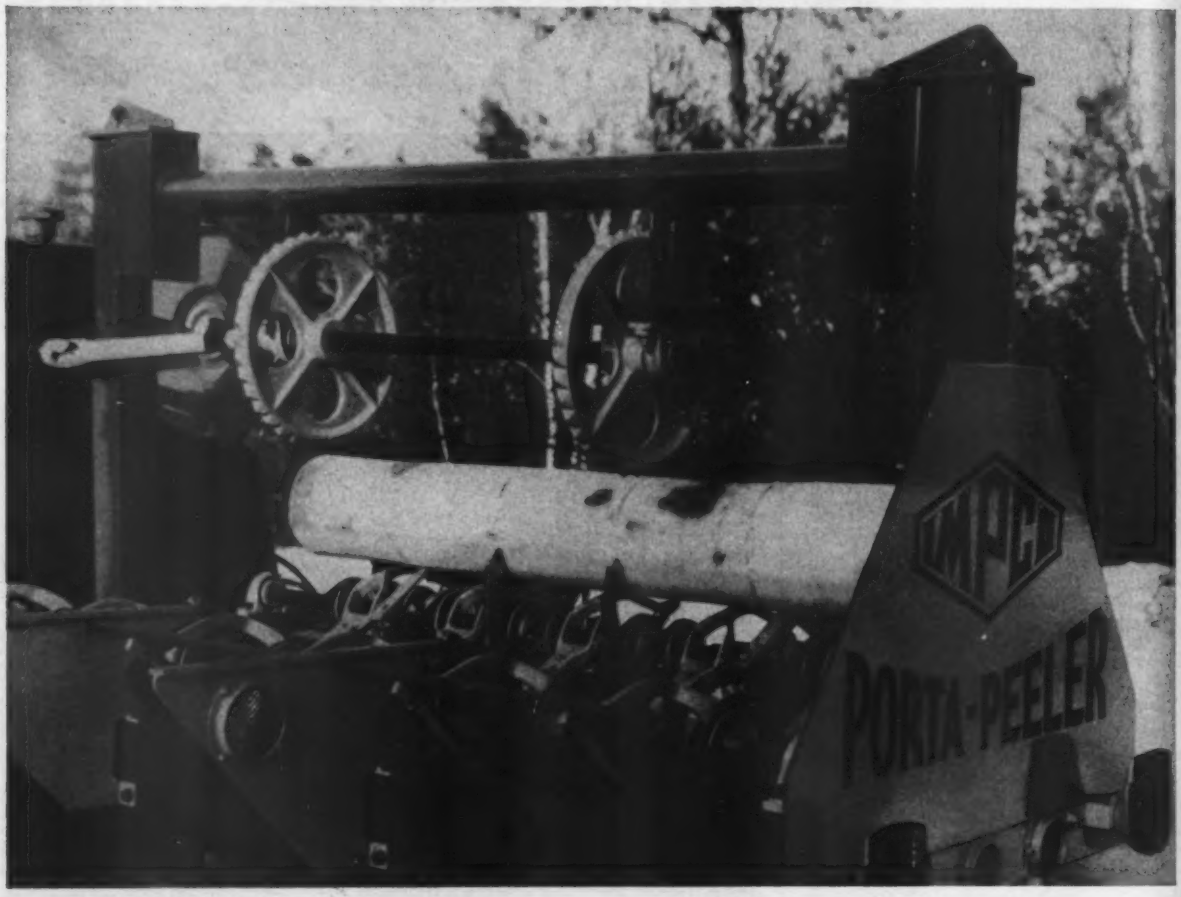
PORTA-PEELED PULPWOOD!



This is the Impco Porta-Peeler in action. Pulpwood contractors and users are receiving it with tremendous interest because of its efficiency and high capacity. Pulpwood suppliers can cleanly bark three to six cords per hour depending on log length. Crooked — knotty — frozen hardwoods — logs up to 26″ in diameter? No problem! Porta-Peelers can be completely mobile for wood road operation or permanently installed in wood concentration yards.

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NEWS of the INDUSTRY

U. S. Group Impressed After Visiting Finnish Paper Mills

A group of executives representing leading American pulp and paper mills have returned home after a two-week tour of Finland's paper mills with a better understanding of Finland's performance and problems in the paper industry.

The two-week program in Finland included visits to such mills as: Enso-Gutzeit in Kotka; A. Ahlstrom in Karhula; Myllykoski Paper Mill; Enso-Gutzeit in Summa; Joutseno-Pulp Co.; Enso-Gutzeit in Kaukopaa; Kymmene Co. in Kuusankoski and Viokka; Rosenlew in Pori; Rauma-Repola O.Y. in Rauma; United Paper Mill in Valkeakoski; Serlachius in Mantta; United Paper Mills in Kaipola; Tervakoski Osakeyhtio in Tervakoski; and Tampella in Ingerois.

U.S.A. and Finland are alike

The U.S. group met with directors of the Finnish Paper Mills' Association, officials of the Finnish Woodworking Industry and technical managers in the mills. Meetings and discussions with these men provided an opportunity to exchange information and to further develop the good relations between the two industry groups.

In compiling their thoughts, the American visitors felt that the paper industry in Finland is situated more or less in the same way as in the United States. There were no greater differences in the methods of production. However, the group had noticed some small tricks and new ideas which could be applied in our factories — such as the utilization of heat and the storing of pulpwood in water. As for quality, the Finnish paper industry is fully competitive on the U.S. market.

Newsprint production in America covers only about 20 per cent of the consumption, the remaining 80 per cent is imported mainly from Canada and North Europe. Finland supplies only about 2 per cent of the imported newsprint. Considerable sums have been invested in the Canadian paper industry and some capital has even been invested in the European Common Market and the Outer Seven. In the last mentioned, rather insignificant sums so far.

This photo, taken prior to the departure of the group, include: Seated left to right — Carl-Erik Flander, vice president of Madden Corp.; John H. Heuer, vice president of Great Northern Paper Co.; Frank M. Jepson, president of Madden Corp.; Dr. George Sheets of Mead Corp. and Ernest H. Vaissiere of Madden Corp. Standing left to right — Kari Hornamo of the Finnish Paper Mills' Association; Dr. Robert March, vice president of Coos Bay Pulp Corp.; Edgar L. Lamb, vice president of Minnesota & Ontario Paper Co.; Henry Fales, vice president of St. Croix Paper Co.; C. G. R. Johnson, vice president of Kimberly Clark Corp.; Martin Mutsch of Madden Corp.; Richard P. Price, vice president of Hammermill Paper Co.; Raymond G. Auwarter of Madden Corp.; and Donal Magrane of Madden Corp.

This group was organized by the Madden Corp. of New York in response to an invitation extended by the Finnish Paper Mills' Association on behalf of the paper industry of Finland. This is the first group visit of American officials to Finland. A similar invitation will shortly be extended to leaders of the Canadian pulp and paper industry.

Flintkote Patents New Method to Produce Insulation Board

A patent application covering a new method of utilizing bagasse in the manufacture of insulation board has been filed by Flintkote Co.

The method was developed by Sung H. Cha, research and quality control director at Flintkote's Hilo plant in Hawaii.

Buckeye's Research Increases Knowledge on Hemicellulose

Increased knowledge concerning the degradation of hemicellulose at high temperatures has been developed at the laboratories of Buckeye Cellulose Corp., Memphis, Tenn.

R. W. Collier, a Buckeye research chemist, stated that the findings would be of special interest to the producers of both dissolving and paper pulps. Collier explains that previously it was known that wood hemicelluloses are destroyed by heating in alkaline solutions such as are used in the pulping of wood in the sulfate process, and in recent years a mechanism was developed for this reaction. Buckeye findings present evidence of a new type to support the existing theory of how cellulose and hemicellulose are degraded by hot alkaline solutions.

Firestone Acquires process for Moisture-Proofing fibres

An unusual process for the moisture-proofing of both natural and man-made fibres has been developed by the Firestone Tire & Rubber Co.

The company states that this new process may find application in the manufacture of a substantial proportion of the paper produced in this country. Negotiations are now underway to make the new process available to manufacturing concerns in various fields on a license basis.

Recent Expansions in the Industry

Langston winder located at Cohoes slits and rewinds fine grades of text, vellum, cover and ledger, ranging from 13-lb. basis to 175-lb. basis.

Two Langston winders at Waterford rewind felt-marked construction and specialty papers ranging from 30-lb. to 150-lb. basis weight.

Mohawk Installs Langston Winders

The expansion and modernization program of Mohawk Paper Mills Inc. has so far resulted in the building of new warehouse space and installation of new Langston paper machine winders.

This program includes the modernizing of both mills owned by Mohawk —one located at Cohoes, N.Y. and the other at Waterford, N. Y. The mills produce various texts, covers, vellums and specialty papers on three fourdriniers, one located at Cohoes and two at Waterford. About 24,000 tons are turned out annually.

At Cohoes

At the Cohoes Division, 48,000 sq. ft. of storage space for finished paper has been provided by the new warehouse. The 110-in. Sandy Hill paper machine has been fitted with a new Rolla-Reel and, according to a report, plans have been made to install a new drive.

One of the major installations at Cohoes was that of a new Langston Winder. This winder is equipped with a roll ejector and a Langston-patented rider roll density controller. Controls for these features are console-mounted for operator control.

Myron Flotow, production manager, stated that the machine is doing an excellent job of rewinding tight, compact, evenly wound rolls. Production ranges from 13-lb. basis to 175-lb. basis. Rolls are rewound varying from 9 in. wide by 40 in. wide in diameter to two 50-in.-wide by 35-in.-diameter rolls. The rolls are then taken to either of two, 110-in.-wide rotary duplex cutters where they are sheeted to specifications.

At Waterford

The new warehouse at the Waterford Division is of equal size to Cohoes. A new 14,000-sq.-ft. building has just been completed where two cutters will soon be installed.

Two 72-in. Sandy Hill fourdriniers located here have recently been improved with Pope-type reels. These machines, in addition to poster and construction papers, produce specialty papers for box facing, linings and covers, such as Mohawk's Navajo cover which comes in 12 colors. Felt-mark papers such as Artemis, Cortlea and Diana are also made.

Both machines are running a 66-in.-wide sheet ranging from 30-lb. to 150-lb. basis weight.

Mohawk has installed two new Langston winders at this mill. Each winder utilizes a General Electric variable speed drive. They are console-mounted for operator control.

William J. Roberts Sr., plant superintendent at Waterford, states: "The winders have made a big improvement in our rolls. The rolls are harder and they are wound off more even than we have ever been able to accomplish before".

Production Equipment Installed by Fabricon Products

Fabricon Products, a division of Eagle-Picher Co., River Rouge, Mich., has announced the installation of new production equipment for the manufacture of polyethylene film.

This new film has been introduced under the name of Fab-Wrap, and is manufactured by the "chill roll extrusion" process. The process is best known for its ability to provide maximum transparency, clarity and gloss.

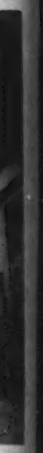
In addition to the current installation, plans call for a second Fab-Wrap production line to be in operation before the end of the year. Emphasis will be placed on producing grades of film suitable for over-wrapping retail products where sales impact, extra protection and long shelf life are important factors. Film is being made for wrapping bread and other baked goods, processed foods, textile and paper products of all kinds.

Converting Plant In Georgia for Gilman

Gilman Paper Co. has announced the placing of a contract for construction of a modern converting plant to be erected in St. Mary's, Georgia.

Under one roof, the building will house the combined multiwall bag plants, grocery bag plants and other converting operations of the Kraft Bag Corp., a subsidiary of the Gilman Paper Co.

The plant will receive its paper from the St. Marys Kraft Corp., a wholly-owned subsidiary of Gilman. St. Marys produces 800 tons of bleached and unbleached paper and



The Beloit Album

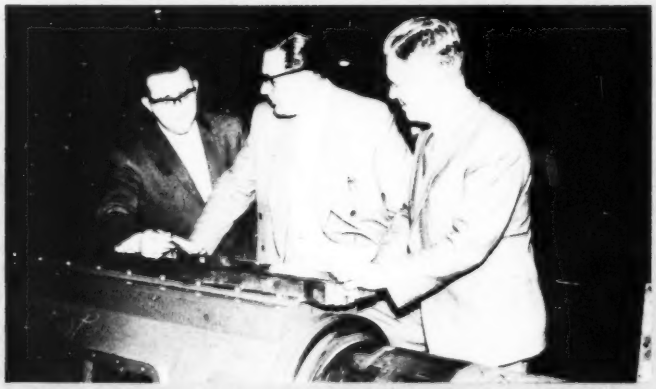
NOVEMBER, 1959

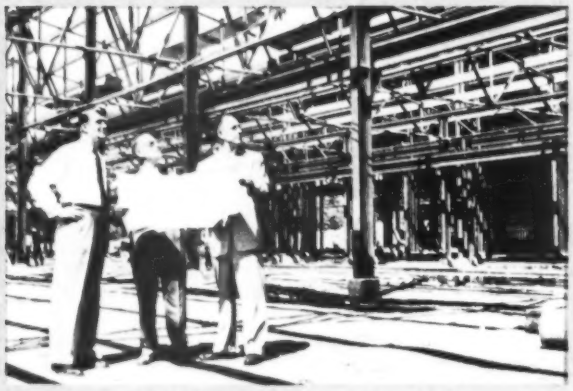
TWO PAST PRESIDENTS OF TAPPI recently visited Beloit: G. W. E. Nicholson *(left)* president, Tennessee River Pulp and Paper Co., and K. O. Elderkin *(right)* president, Bowaters Engineering and Development Inc. They are pictured with Beloit's chairman, E. H. Neese. Past, present, and future papermaking techniques were among the topics discussed.

MINNESOTA AND ONTARIO PAPER COMPANY's paper machine superintendent, L. A. Evenson *(l)* and general superintendent, paper, N. L. Jurgensen, hold a discussion beside the new Beloit 158" publication grade machine at International Falls, Minnesota.

THE CRYSTAL TISSUE COMPANY's vice president, manufacturing, John Burdsall *(c)* discusses slice assembly on erecting floor with Fay Mills *(l)* and Pete Jerardi, Beloit's Ohio representative.

THAMES BOARD MILLS LTD.'s William King *(c)* and S. J. Wright *(r)* visited Beloit during their recent American tour. Beloit's E. N. Glauner, Jr. reviewed suction roll packing arrangements with them.





CONSTRUCTION PROGRESS at Pittsfield is reviewed in one of the machine shop bays by Jones Corp. executives: *(l to r)* William Sorenson (Beloit) plant engineer, Dwight Jones, executive v. p., D. W. Curtis, assistant to president.

ROOF TRUSSES frame steelworkers on the new plant scheduled for occupancy in 1960. Shop and erecting bays are high and wide for greatest efficiency. Modern system of fluorescent lighting will illuminate windowless shops.

E. D. JONES CORP., Pittsfield, Massachusetts, adds new products, facilities to "the Beloit Group"

"Turn-key" mills—complete from pulping to finished sets—were made available to Beloit customers last year when E. D. Jones Corp., Pittsfield, Mass., became a member of the Beloit Group. The Jones line of pulp and stock-preparation equipment, in wide use throughout the papermaking world, is now offered in conjunction with the high-speed, high-production paper machinery with which Beloit has equipped leading mills for over a century.

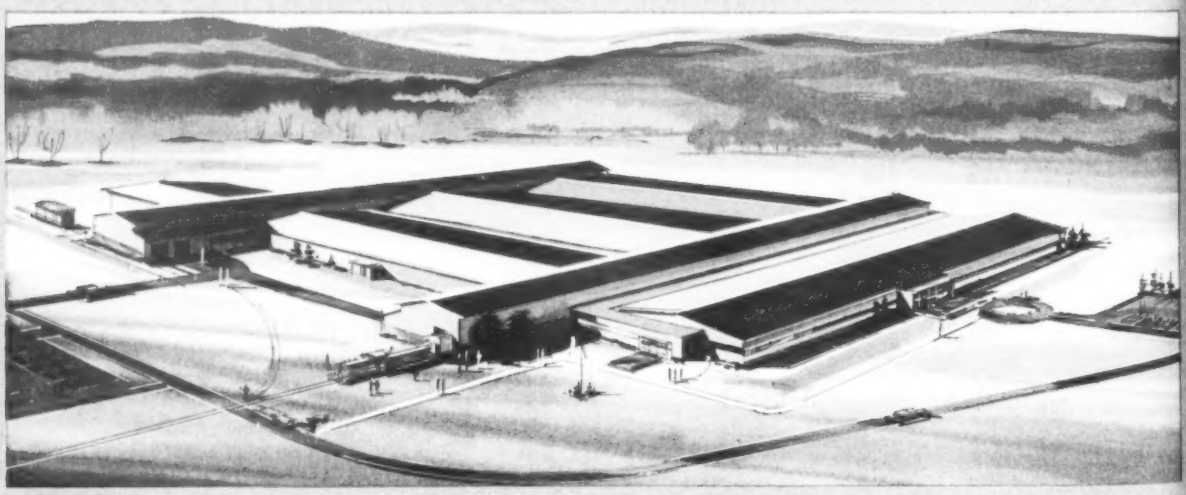
The Jones organization, founded in 1845, is one of the few industrial concerns in the U. S. which has been in continuous operation by the same family for more than 100 years.

Completion of the modern plant at Pittsfield, scheduled for occupancy early in the first quarter of 1960, will double present Jones manufacturing facilities and is expected to quadruple production capacity. Plant area has been engineered to permit future expansion up to 640,000 square feet. Correlated activity of the Beloit and Jones organizations makes the Beloit Group more effective than ever as "your partner in papermaking."

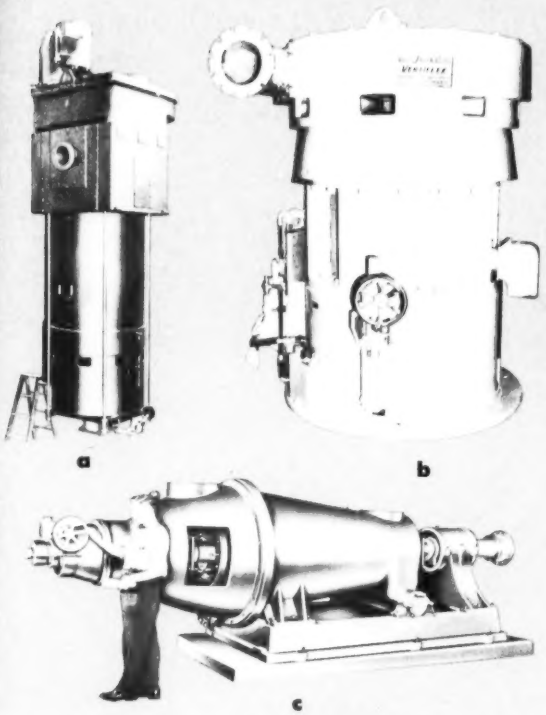
* * *

Jones Pulp Mill equipment: Vertiflex chip shredders and primary refiners—Condi continuous digestion systems for all types of pulp—Zenith dewatering presses—Berkshire hot stock refiners—Condi asphalt dispersion systems.

Jones Stock Preparation equipment: Hi-Lo, Pulpmaster, Liebeck and Turboflex pulpers—Jones high-production beating units and washers—Midget, #1, Stockmaster, Fibremaster, Royal, Imperial, Majestic and Leviathan jordans—Berkshire hi-angle conical refiners—Double-D and Vertiflex disc refiners—Jones vacuum and flotation savealls—custom-designed stock chests and agitators.

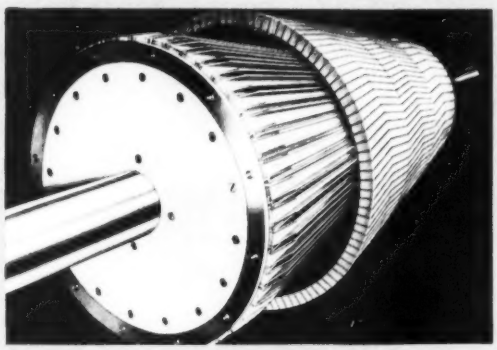


200,000 SQ FT will be available in E. D. Jones Corp. plant now under construction at Pittsfield. Fabricating and machine shops connect erecting floor *(l)* with receiving and storage bay *(r)*. Plant has complete rail and truck shipping-receiving facilities. Switch tracks lead directly to main line of New York Central railroad. Massachusetts Turnpike is only a few miles away.



a b c

Extensive Jones line of pulp mill equipment and stock preparation machinery includes: **a**, Zenith 020 dewatering press with floating cone; **b**, Vertiflex single disc refiner for chip shredding and primary defibering; **c**, Leviathan Jordan; **d**, Jones "Adapta-Plug" and "Fulbar" one-piece shell filling.



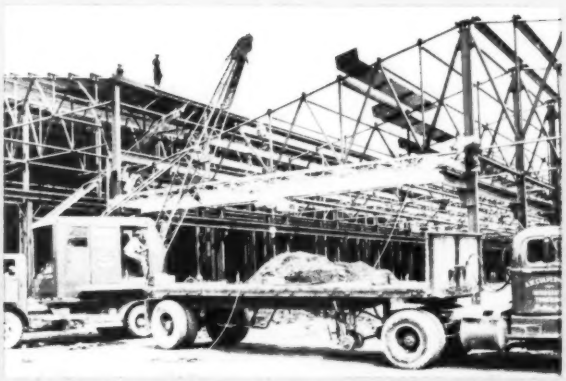
d

E. D. JONES CORP. member BELOIT group PITTSFIELD, MASS.

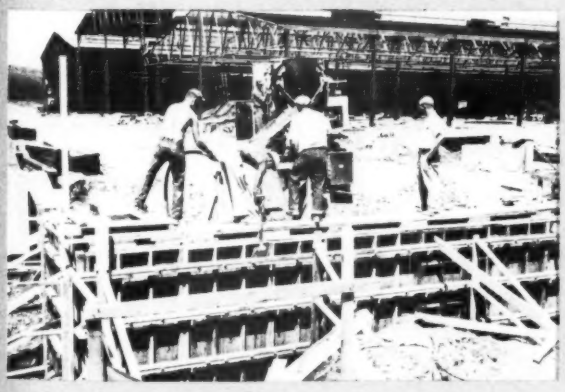
Jones

PULP MILL EQUIPMENT AND STOCK PREPARATION MACHINERY

NEARLY COMPLETED HEAVY MACHINE SHOP, with erecting floor footings appearing in the foreground.



BRIDGE CRANE is eased into position in light machine shop. Crane is one of 15 being installed to serve shops.



SHIPPING AREA at end of erecting floor takes shape as workmen pour forms. Woodshop will be located to the left.

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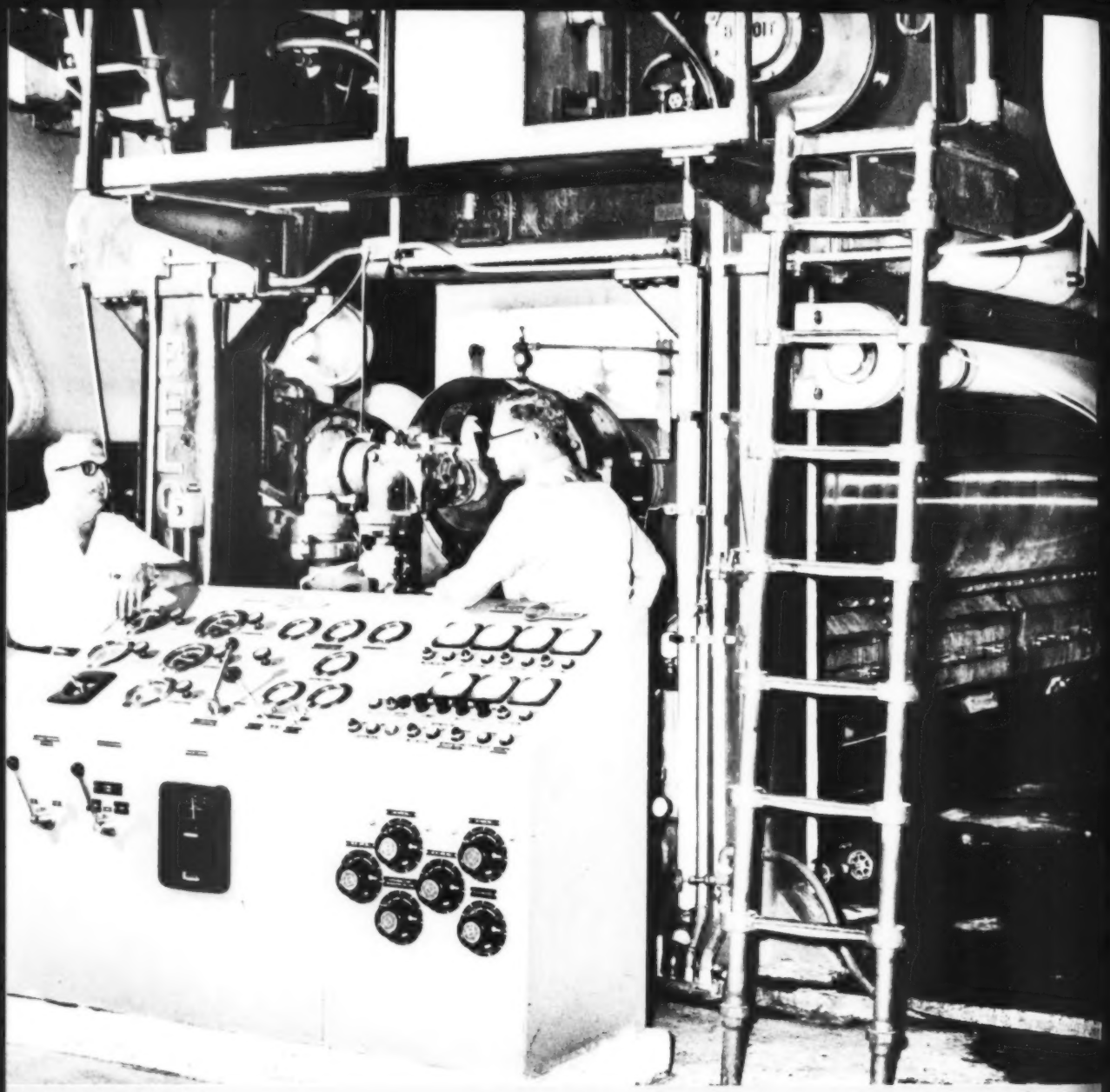
BELOIT

PAPER MACHINERY

BELOIT IRON WORKS PAPER MACHINERY BELOIT, WIS. U.S.A.



S. R. Christensen.

EXTENSIBLE UNIT, recently installed on #1 machine at International Paper Company's Southern Kraft Division Mill at Camden, Arkansas, produces the dramatic new CLUPAK* papers. Camden mill manager Albert Rozyskie (*l*) and paper mill superintendent R. M. Miles, are shown at the unit's control console. CLUPAK, Inc. has appointed Beloit to build extensible units under patents owned by CLUPAK, Inc. Several highly successful commercial installations have been made; additional units are on order. The patented process whereby CLUPAK paper is made brings a new dimension to paper-engineered stress and strain properties. While the process to date has been limited to kraft, principles of manufacture and characteristics are applicable to all grades.

*CLUPAK, Inc.'s trade-mark for extensible paper manufactured under its authority.

your partner in papermaking

BELOIT

BELOIT IRON WORKS PAPER MACHINERY BELOIT, WIS. U.S.A.

WHEN YOU BUY BELOIT . . . YOU BUY MORE THAN A MACHINE

PAPER MACHINERY

Printed in U. S. A.

pulp per day. It operates two wide, fast-running paper machines, one making unbleached kraft papers, and the other making bleached foodboard (coated and uncoated) for converting into drinking cups, milk containers and flexible packages for food products.

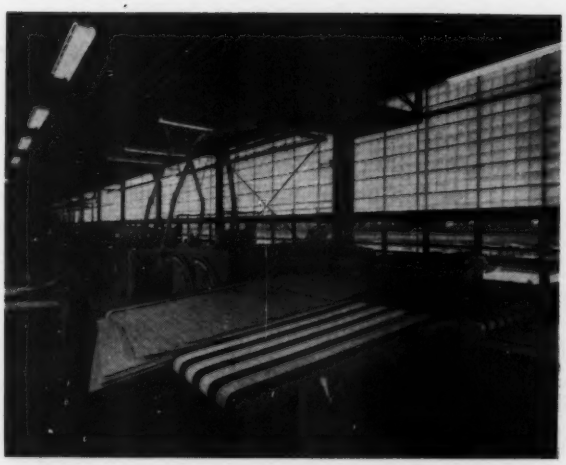
Chicago Welcomes New Corrugated Box Plant

On October 15, Chicago formally welcomed the new corrugated box plant built by the Paper Products Division of Owens-Illinois.

The plant, located on a 40-acre tract in the southern part of the city, has a total floor area of 224,400 sq. ft. — 213,400 sq. ft. for factory, shops and warehouse, and the remaining 11,000 sq. ft. used for office space.

Converting its own corrugated from roll stock at approximately 65 million sq. ft. per month (on an 85-in. Langston corrugator), the plant will produce a full range of corrugated shipping boxes. The roll stock will be supplied from O-I's mills in Wisconsin, Georgia and Florida and from other suppliers. More than 4,000 tons per month of paper will be used.

Officers of the new Chicago plant will be: L. T. Moore, general manager; G. Farrah, production manager; and G. Rehfield, sales manager.



The 300-ft. Langston corrugator (above) is equipped with electronic controls to govern the movements of the unit. Top production speed is said to be at 600 lineal fpm at a width of 85 in. At the take-off end (right) cut and creased corrugated boards are delivered off the side and are stacked onto a pallet, while another size is being delivered straight down the conveyor to the right.

A printer-slotter will handle sheets of corrugated up to 60 by 126 in. and will slot and print a two-color message at the rate of 175 sheets a minute.

Flattened out corrugated boxes ready for shipment are automatically compressed and banded by this machine. These units have a self-contained loading device. Cross sections of the corrugated tube are glued to scrap board to form a built-in pallet for movement in the customer's plant by fork lift truck.

Let's face it — it's much more economical to remove water at the **wet end** of the paper machine than through the dryer section! Inefficient, poor-draining felts can run your steam costs up prohibitively, or force you to slow down your machine.

Albany Felts allow top speed and production. Why? Albany Felts are designed for efficient drainage, balanced with the necessary characteristics for life and finish. This means more profitable felt performance for you.

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LABORATORY SERVICE
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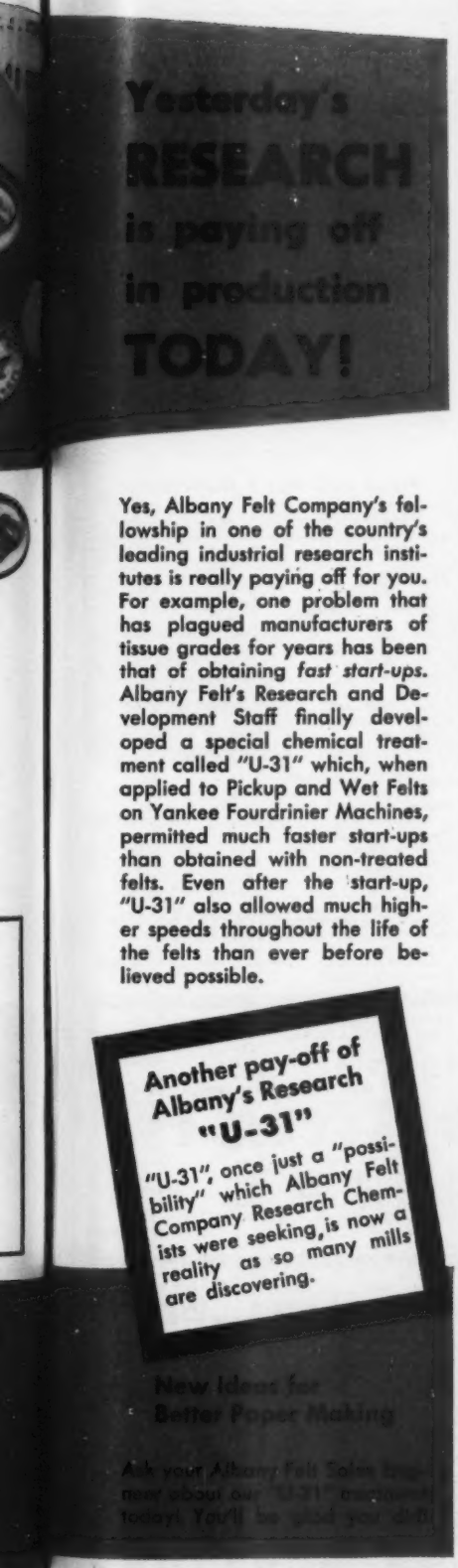
TALK IT OVER WITH YOUR ALBANY FELT SALES ENGINEER

ALBANY FELT COMPANY
ALBANY, N. Y.

AF


Yesterday's
RESEARCH
is paying off
in production
TODAY!
Yes, Albany Felt Company's fellowship in one of the country's leading industrial research institutes is really paying off for you. For example, one problem that has plagued manufacturers of tissue grades for years has been that of obtaining *fast start-ups*. Albany Felt's Research and Development Staff finally developed a special chemical treatment called "U-31" which, when applied to Pickup and Wet Felts on Yankee Fourdrinier Machines, permitted much faster start-ups than obtained with non-treated felts. Even after the start-up, "U-31" also allowed much higher speeds throughout the life of the felts than ever before believed possible.
Another pay-off of Albany's Research
"U-31"
"U-31", once just a "possibility" which Albany Felt Company Research Chemists were seeking, is now a reality as so many mills are discovering.
New Ideas for
Better Paper Making

News of the Industry . . .

City to Build Box Plant for Canton

The First Canton Corp., a subsidiary of First Mississippi Corp., will open a new paper carton and box manufacturing plant at Clinton.

The city of Clinton, under the state's Balance Agriculture With Industry Program, will build the new 30,000 sq. ft. plant for the firm.

No Immediate Plans for Potlatch's Southern Mill

A statement recently made by a company spokesman of Potlatch Forests Inc. revealed that the firm had immediate plans to construct a $35 million paper mill near Rohwer, Ark.

Potlatch later stated that the pulp and paper mill eventually will be constructed in the South but not until market conditions justify it. Immediate plans do not exist.

Pakistan's First Newsprint Mill

P. R. Sandwell & Co. of Vancouver, B.C., has designed, built and put into production Pakistan's first newsprint mill at a capital cost of $18 million.

The Canadian engineering and management group, headed by P. R. Sandwell, was engaged by the government-operated Pakistan Industrial Development Corp. The program was part of Pakistan's program to balance its economy by creating new industry to develop raw materials.

The mill has a capacity of 130 tons daily.

Allied News Notes

Planet Corp., Lansing, Mich., designer-manufacturer of engineered materials handling systems and automation equipment for industry, has announced the appointment of two sales organizations to represent them in the Alabama area and the Pacific northwest. Headquartered in Birmingham, Ala., **Benedict & Boggs Co.** an industrial equipment engineering and sales concern, will sell all types of Planet systems to industry in Alabama and adjacent areas. Sales in Washington, Oregon, northern Idaho and British Columbia will be handled from Edmonds, Wash. by Earl A. N. Johnson, a process equipment sales agent.

Jamesbury Corp., ball valve manufacturer of Worcester, Mass., is expanding its total plant area for the second time in less than a year. The newest addition will enlarge the present plant's floor space by 70 per cent. The previous addition, just completed, provided five times more floor space to the plant. A sharply rising demand from private industry and the U. S. Navy has necessitated plant facility expansion.

Coming Events

TAPPI

November 19 — Delaware Valley section Engineers Club, Philadelphia, Pa.
December 1 — Golden Gate District plant visit to Dow Chemical Co.
December 3 — Kalamazoo Valley section, Inman's Restaurant, Galesburg.
December 10 — Ohio section Manchester Hotel, Middletown, Ohio.
December 11 — New England section Past Chairmen's Night.
January 11 — New England, Eastern District, Armand's Restaurant.
January 12 — Pacific section, Longview, Wash.

PIMA

December 3-5 — Pacific Coast Division (annual fall meeting), Olympic Hotel, Seattle, Wash.
January 21 — Michigan Division (joint meeting with Kalamazoo Valley section of TAPPI), Hotel Harris, Kalamazoo, Mich.
February 18 — Michigan Division, Hotel Harris, Kalamazoo, Mich.
April 23, 1960 — Michigan Division (ladies night), Hotel Harris, Kalamazoo, Mich.

OTHER MEETINGS

November 16-18 — Twenty-first Annual National Packaging Forum of the Packaging Institute, Statler-Hilton Hotel, New York.
November 17-20 — PMMI Packaging Machinery Show, New York Coliseum, New York.
November 30 -December 4 — Twenty-Seventh Exposition of Chemical Industries, New York Coliseum, New York.
December 1-2 — Pulp, Paper and Paperboard Industrial Waste Conference, Edgewater Beach Hotel, Chicago.
January 25-28 — Plant Maintenance & Engineering Show, Convention Hall, Philadelphia, Penn.
February 1-4 — Second Southeast Heating & Air-Conditioning Exposition, Memorial Auditorium, Dallas.
February 8-10 — Fifth Military-Industry Packaging and Materials Handling Symposium, Sheraton Park Hotel, Washington, D.C.
March 27-30 — National Paper Trade Association Annual convention, Waldorf-Astoria, New York.
March 29-31 — Twenty-second annual American Power Conference, Hotel Sherman, Chicago.

Burgess Pigment Co., Sandersville, Ga., producers of hydrous and anhydrous aluminum silicate pigments and kaolin clays, announces the installation of a new Nichols Herreshoff furnace. Completion of the new plant was scheduled for November 1st. This additional facility will more than double BP's production capacity, enabling it to better serve the needs of the paper and paperboard industry.

Crane Co., Chicago, Ill., has recently purchased all properties and assets of **Chapman Valve Mfg. Co.**, Indian Orchard (Springfield) Mass. A wholly-owned subsidiary of Crane Co., CVM will retain its present management and executive staff. T. M. Evans, chairman of Crane, stated that plans for the Chapman plant include manufacture of all products now manufactured by Chapman for which there is an adequate demand.

Plans for acquiring assets of **Valley Iron Works Co.**, Appleton, Wis., by **Allis-Chalmers Mfg. Co.**, Milwaukee, Wis., were recently announced by R. A. Peterson, Valley Iron president. Allis-Chalmers will acquire the business with authorized but unissued stock, Valley Iron operating as a wholly-owned subsidiary of Allis-Chalmers under the name of **Valley Iron Works Corp.**

Niagara Wire Weaving Co., Niagara Falls, Ont., now has a subsidiary plant in the U. S. — **Southern Wires Inc.**, Quincy, Fla. Operating from a 50,000-sq. ft. plant, it will supply the expanding paper mill industry in the southern U. S. with wire cloth for paper-making machines. Partially equipped with machinery brought from Canada, the new plant expects to be in full operation within a year or two.

Pelican Supply Co. Inc., recently purchased by Thomas A. McElroy and Morley A. Hudson, has its main office, supply store, steel warehouse and shops in Shreveport, La., a branch and steel warehouse in Lake Charles and an oil field supply store in New Iberia. Pelican currently supplies equipment to the forest products industry, refineries, gasoline plants, petro-chemical industry, paper and pulp industries, machine shops and other industries in the Ark-La-Tex area and in southwest Louisiana.

Electric Storage Battery Co. of Philadelphia has recently purchased the **Chemical Linings Inc.** of Watertown, N. Y. Under its new ownership, Chemical Linings will be supervised by **Atlas Mineral Products Co.** of Mertztown, Pa., which is a wholly owned subsidiary of Electric Storage. Atlas is a 67-year-old manufacturer of corrosion-resistant cements and fabricated plastic equipment. The joint operation will provide Chemical Linings with a more complete product line, plus the benefit of expanded technical facilities to enable it to give better service to its customers.

Current Comments . . .
(Continued from page 571)

annual sales of approximately $2 million.

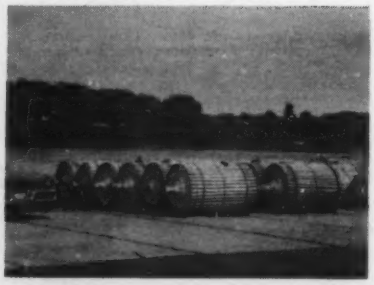
● John Strange Paper Co. has executed a contract for the purchase of all outstanding shares of common capital stock of Appleton Mfg. Co. Transfer of ownership is not expected until the close of this year. Appleton will be operated as a subsidiary of John Strange under the management of John M. Hayes, president of Appleton.

At the Port of Oswego (shown at left), the ocean freighter, Santa Cristina awaits the loading of cargo to be shipped via St. Lawrence Seaway. Approximately 150,000 lbs of used paper mill equipment (shown below) was shipped from the Port of Oswego direct to LaGuaire, Venezuela.

Osborne uses St. Lawrence Seaway

Osborne Paper Mill Equipment Corp. of Fulton, N. Y., has made its first shipment of heavy equipment on the St. Lawrence Seaway.

Using the Port of Oswego, Osborne shipped a cargo of approximately 150,000 lbs of used paper mill equipment direct to La Guaire, Venezuela.



Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	Oct. 9, 1959	Sept. 10, 1959
American Can	43⅞	43
Same Pref.	* 36⅞	38⅛
Celotex	34¼	37
Same Pref.	* 18-18½	* 19-19⅝
Certain-Teed	13⅛	12¾
Champion P. & F.	43	41¼
Same Pref.	88⅜	* 90-90½
Chesapeake of Va.	* 38⅛-41⅛	41
Container	29⅞	27⅜
Same Prof.	* 82-85½	* 87-89
Continental Can	48¾	47¾
Same Pref.	78¾	* 77-80¼
Crown Zellerbach	56⅞	53
Same Prof.	88¾	* 87¾-90
Diamond National (New)	32¼	32
Same Pref.	28¾	* 30-30¼
Federal Paperboard	49	48¼
Same Pref.	* 21¾-22	* 22⅛-22⅝
Fibre Paper Board	52½	52
Great Northern	52½	51⅞
Hammermill	32¼	34⅛
International	128½	125
Same Pref.	* 88¼-89	* 89½-90
Kimberly-Clark	65	64½
McAndrews & Forbes	31½	* 30-30¼
Masonite	34⅛	36¾
Mead Corp.	45¾	47
Same Pref.	* 87½-88½	* 89⅛-92½
Minnesota & Ontario	33	33
Oxford Paper	33	34
Same Pref.	93	* 93-93¼
Rayonier	24½	23⅛
Riegel	39¾	44⅛
St. Regis	52⅜	47½
Same Pref.	* 91-97	93¾
Scott Paper	81¼	82
Same $4 Pref.	* 87⅛-89½	88¼
Same $3.40 Pref.	* 76-79½	* 77-78¼
Sealright	38¼	* 39¼-40
Standard Packaging	33¼	34¼
Same $1.60 Pref.	* 95-105	99
Same $1.20 Pref.	36¾	39½
Sutherland Paper	36¾	37⅝
Union Bag-Camp	45	42¼
United B. & C.	33½	32
United Wallpaper	8⅞	8⅜
Same Pref.	16	* 18½-18½
U. S. Gypsum	97⅜	100¾
Same Pref.	*145½-155	*151-153¼
West Va. P. & P.	48¼	48
Same Pref.	* 96½-99	* 92¼-95

New York Stock Exchange — Bonds

Champion P. & F. 4¾%	110	109
Champion P. & F. 3¼%	93½	—
Diamond Gardner 3%	—	—
Kimberly-Clark 3%	86½	90½
Mead Corp. 3%	—	—
Oxford 4¾%	111	110
Scott 3%	104¾	106¼

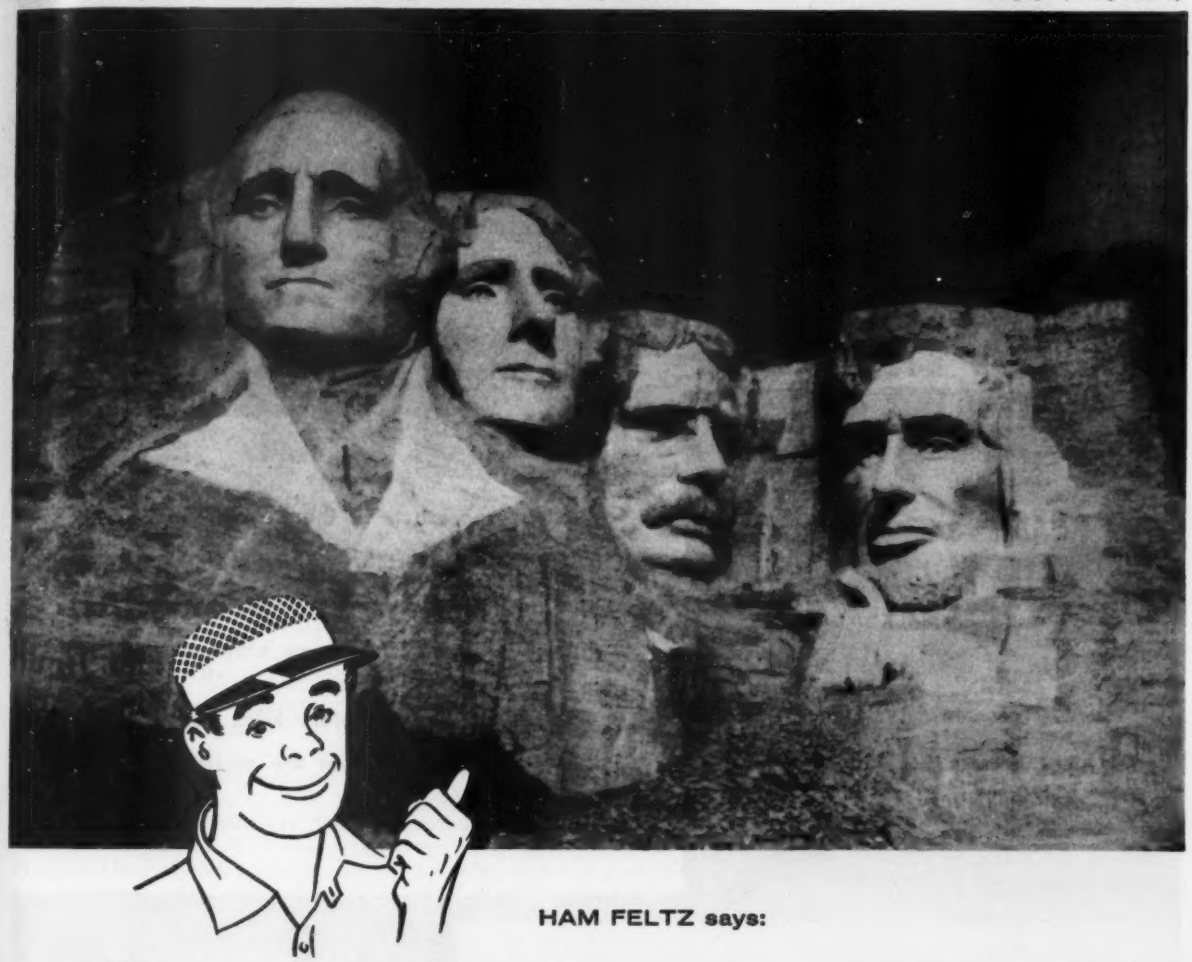
American Stock Exchange — Stocks

Allied Paper	11¾	11
American Writing	32	32
Brown Co.	12⅜	12¾
Puget Sound	24⅛	24⅛

*Closing Bid and Asked Prices

*Submitted by: H. C. BEMENT, 10026 Klingerman St., El Monte, Calif.

Photograph by: Ewing Galloway



HAM FELTZ says:

"Reminds me of HAMILTON Felts' giant felt loom!"

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Hamilton

FELTS

* **WIN... A NEW Spincast Fishing Outfit**

"What famous landmark reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. The best letter each month by a papermaker wins a new 1959 model Shakespeare Spincast Rod and Reel — FREE! Every papermaker entrant receives a famous Rex Spoon fishing lure — FREE. Send me your suggestion — today. Ham Feltz, 612 First National Bank Bldg., Cincinnati 2, Ohio."

"The Mt. Rushmore National Memorial in the Black Hills has an altitude of 6,200 feet. Sculptured in the granite face of this mountain are the heads of Washington, Jefferson, Lincoln and Theodore Roosevelt. It's the biggest in the U. S. A. — just as our new giant loom is the biggest — 6½′ wider than any other in America . . . installed in anticipation of the day when *you* will need wider felts.

This is just another of the modern, meaningful forward moves at Shuler & Benninghofen that guarantee you the best felts to solve *your* specific need."

Ask your Hamilton Felt Service Salesman about our 300 proven styles.

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For Reburning Lime Sludge

We are specialists in the design and manufacture of rotary kilns, coolers and auxiliary equipment for burning lime, lime sludge and for many other purposes.

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NAMES in the NEWS

Fibre Box Association

The following men have been elected to serve as directors of the Fibre Box Association.

John G. Kain, president of the Star Box & Printing Co.; Ralph A. Wilkins, vice president of Bird & Son Co.; Charles U. Harvey, general manager of the eastern division, Fibre Drum & Corrugated Box Div., Continental Can Co. Inc.; Lester R. Edwards, vice president of Owens-Illinois Glass Co.; D. C. Shepard Jr., general manager of Menasha Wooden Ware Corp.; and A. W. Dufrechou, vice president of sales for Kohlmann Box Co.

Riegel Paper Corp.

A. P. Mitchell, senior vice president of sales, has been appointed to a newly created post as director of marketing. However, he will continue as senior vice president.

The New Jersey division, which recently changed its name to Specialty Products Division, has made the following changes; G. Lamont Bidwell, formerly vice president and manager, has been named vice president and general manager. Charles E. Schaehrer has been elected a vice president of the corporation and has also been named sales manager of the Specialty Products Division. A. J. Ericsson, product manager for merchant and industrial sales; O. E. Lohrke, manager of merchant sales; and Benjamin Foose Jr., manager of industrial sales, will all report to Schaehrer.

In the Carolina Division, Dr. C. E. Hardford, formerly vice president and manager, has been named vice president and general manager. Winthrop Endicott has been named sales manager of paper and paperboard.

St. Regis Paper Co.

As a result of reorganization of the company's technical activities, St. Regis has made the following appointments.

Dr. Kenneth A. Arnold has been appointed to serve as director of research and development and will be responsible for the company's research and development programs in the fields of pulping, papermaking, coating, polymers, packaging materials, engineering physics, by-products and graphic science.

Dr. Robert W. Reed has accepted the appointment as director of technical services and control. He will be responsible for quality control and technical services to manufacturing and sales on printing papers, kraft papers, multiwall bags and packaging materials.

Thomas A. Hewson has been appointed director of technical planning with responsibility for operations research, technical-economic evaluations of projects, products and processes and liaison with intercompany groups.

K. R. Bendetsen

H. W. Rigby

B. V. Wright Jr.

D. J. Thomson

West Virginia Pulp & Paper Co.

The position of regional production manager for the Hinde & Dauch Division has been given to Judson Mealy. In his new post, Mealy will be in charge of production of the H & D plants located at Cleveland, Detroit, Eaton, Ohio and Sandusky.

Dr. Arthur M. Stern is being transferred from the Covington Research Laboratory to Washington, D. C., where he will open an office. This move is in connection with responsibilities recently added to his position as head of microbiological research for West Virginia. Stern has taken on duties as coordinator for the company's research efforts in the food additive field. With his office in Washington, Stern can be readily in touch with FDA officials.

The Hinde & Dauch Division has appointed John C. Wellons as personnel manager for the region of this division with headquarters at Richmond, Va. This region includes corrugated box plants at Richmond, Baltimore and Gastonia, N. C.

Champion Paper & Fibre Co.

H. W. Suter, Herbert T. Randall, W. M. Benzing and John P. Osborne have been elected to serve on the newly created advisory board to the president and have also been named honorary vice presidents. Randall and Suter will also continue to serve the company as directors.

Henry W. Rigby was named executive vice president, corporate development and international group.

Karl R. Bendetsen was named executive vice president of the operations group.

Benjamin V. Wright Jr. was elected vice president of finance.

Dwight J. Thomson was named executive vice president of the company's converting products group.

Crossett Co.

The promotion of the following nine men has been made to complete the organization of the company's new production department.

W. B. Jenkins, paper mill superintendent in the kraft mill, will now be assistant mill manager of the kraft operation.

F. E. Woods, assistant paper mill superintendent of the bleached food board mill, will now be assistant mill manager.

A. G. McCaughan, assistant superintendent of the Kraft paper mill, will now be superintendent of that mill.

L. C. Thomas, tour foreman, will now be assistant superintendent of the bleached food board mill.

Q. W. Vancleave, technical service department, will now be assistant paper mill superintendent of the kraft mill.

Names in the News . . .

W. W. Webster, tour foreman, will now be assistant pulp mill superintendent of the food board mill.

E. F. Walling, machine tender, will now be machine room tour foreman in the food board mill.

D. C. Rogers, temporary tour foreman, will now be permanent tour foreman.

L. B. Linder, pulp mill operator, will now be pulp mill tour foreman in the board mill.

Allied Personalities

Byron K. Hartman has been appointed executive vice president and general manager of Syntron Co., a subsidiary of Link-Belt Co. Hartman who has been sales manager of Link-Belt's Colmar plant, has been with Link-Belt since 1937. **Robert G. Bottorf** will succeed Hartmen as sales manager of the Colmar plant. Bottorf has been a designer at the company's Philadelphia plant, district sales engineer in Buffalo and a materials handling specialist at the Philadelphia and Colmar plants. Link-Belt also announces the appointment of **Charles W. Beauchamp** as marketing manager to head up all sales activities of the company's Ewart plant in Indianapolis. **Kindrick M. Hickman** has been appointed sales manager. These appointments follow the retirement of **Forest H. Spencer** after 40 years of service. For the Pacific Southern Division, Link-Belt has appointed **Charles J. Naulty** as sales manager for the division. He will succeed **Benjamin M. Prestholt,** who has returned to the company's Caldwell plant in Chicago.

Harold E. Keene has joined the sales staff of Improved Machinery Inc. of Nashua, N.H. He will represent Impco in Tennessee, Southwestern North Carolina, North and Central Georgia, North and Central Alabama and Northern Mississippi. Previous to his association with Impco, he was employed by Goslin-Birmingham Mfg. Co. Inc.

Promotion of **Robert W. Hohman** to senior sales engineer for the midwest region has been announced by John W. Bolton & Sons Inc. **Harris Blake Jackson** has been appointed southern sales representative for J. W. Bolton & Sons Inc. and the Emerson Mfg. Co. Div.

Raymond O. Reed, of the Lamb-Grays Harbor Co. Inc., Hoquiam, Wis., who has been with the company since 1955 as sales engineer and manager of engineering, has now been transferred to Neenah, Wis., in the capacity of sales representative for the Great Lakes area. **Robert F. Neilson,** sales engineer, has been added to the staff at the Hoquiam plant.

Everett D. Cann, previously with the research department of Hudson Pulp & Paper Corp., has joined the Pulp & Paper Group of Chas. T. Main Inc. An addition, **Ralph H. Bernstein,** previously from New Haven Board & Carton Co., has joined the engineering staff of Chas. T. Main Inc.

Titanium Pigment Corp., a subsidiary of National Lead Co., has announced the appointment of two new sales representatives, **Charles L.**

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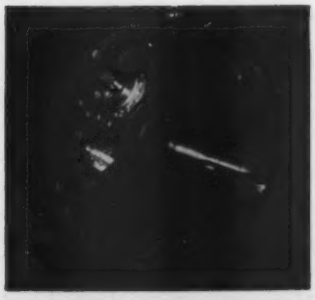


Novak to the New York staff in New York city and Thomas T. Wisner to the North Central staff serving the Cleveland area.

Ralph E. Weimer has been appointed by the Industrial Products Div. of Tyer Rubber Co., Andover, Mass., as a manufacturer's agent for the sale of rubber roll coverings.

Sam H. Fitzpatrick has rejoined Miehle-Goss-Dexter Inc. as a sales representative handling Miehle, Dexter and Lawson products in the San Francisco area.

Smith & Winchester Mfg. Co., South Windham, Conn., has announced the addition of two engineers, John A. Card and Joseph Magiera, to their staff.

John M. Coffey and Robert S. Forsyth have been promoted to the position of senior development chemist for the National Starch & Chemical Corp. Coffey joined National in 1953 serving the company in resin research. He was then transferred to technical service at the company's Alexander, N. J., laboratories. He returned to Chicago in 1957 to continue activities in adhesive development and field service. Forsyth, who has extensive background in packaging machinery work, joined National's technical development in group 1952.

Necrology . . .

Rufus Barkley

Rufus C. Barkley, 58, of Jacksonville, Fla., was chairman of the board of directors for the Cameron & Barkley Co. Barkley was a native of Charlestown, S. C.

George Kaplan

George L. Kaplan, 77, president of Minnesota Envelope Co. and Kaplan Paper Box Co., St. Paul, Minn., also founded Iowa Envelope Co., Des Moines, Iowa, and was chairman of the board of Continental Envelope Co., Chicago. Kaplan's companies pioneered development of many types of packaging used for industrial and consumer products all over the country.

Horace Horton

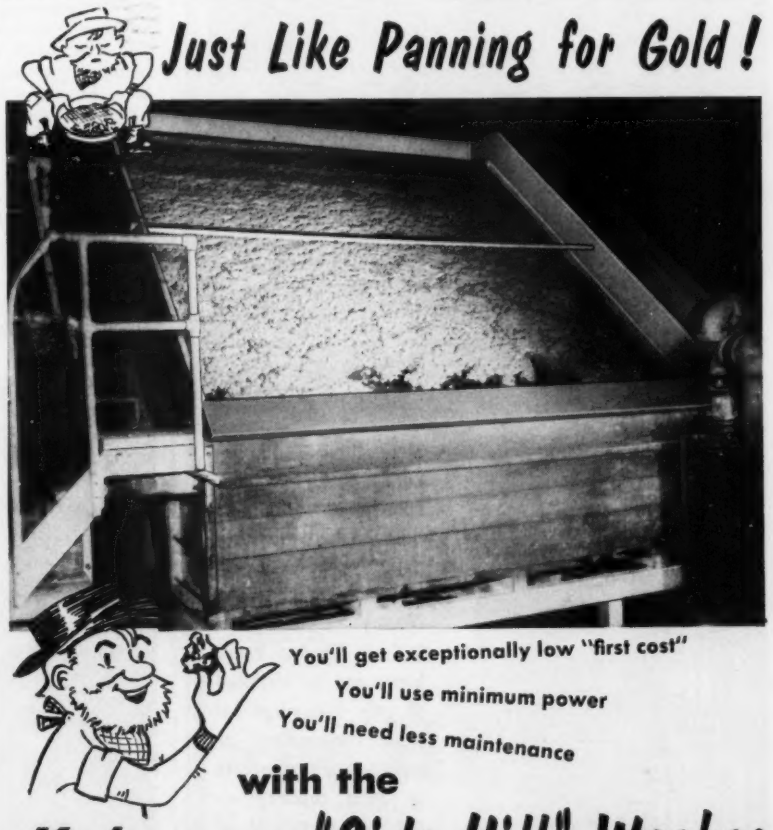
Horace B. Horton, board chairman of Chicago Bridge & Iron Co., was 73. The oldest employee of the company in length of service, Horton joined CB&I in 1907. Five years later he was elected treasurer and a director. He was named president in 1945 and chairman of the board 11 years later. In addition to his duties with CB&I, he was a director of several subsidiary companies. Horton was a member of the National War Labor board from its organization in 1942 until the end of World War II. He also served on the Hoover Commission in 1954-55.

Ralph N. Fowler

Ralph Norman Fowler, 86, was a former chairman of the board of Hampden Glazed Paper & Card Co., Holyoke, Mass. An employee of the Holyoke concern for more than 60 years, Fowler served as its superintendent, general manager, treasurer and president. He was elected board chairman in 1956-57 and also served as director of Valley Paper Co. of Holyoke.

Lowell Newman

Lowell M. Newman, 55, of Monroe, Ohio, was plant engineer at Crystal Tissue Co. and a prominent civic leader in his home town. He was a member of the American Society of Mechanical Engineers, the Ohio section of Tappi and the Paper Industries Management Association, and was a licensed professional engineer of Ohio. Chairman of the Monroe Planning & Zoning Commission and engineer of the Monroe Board of Public Affairs.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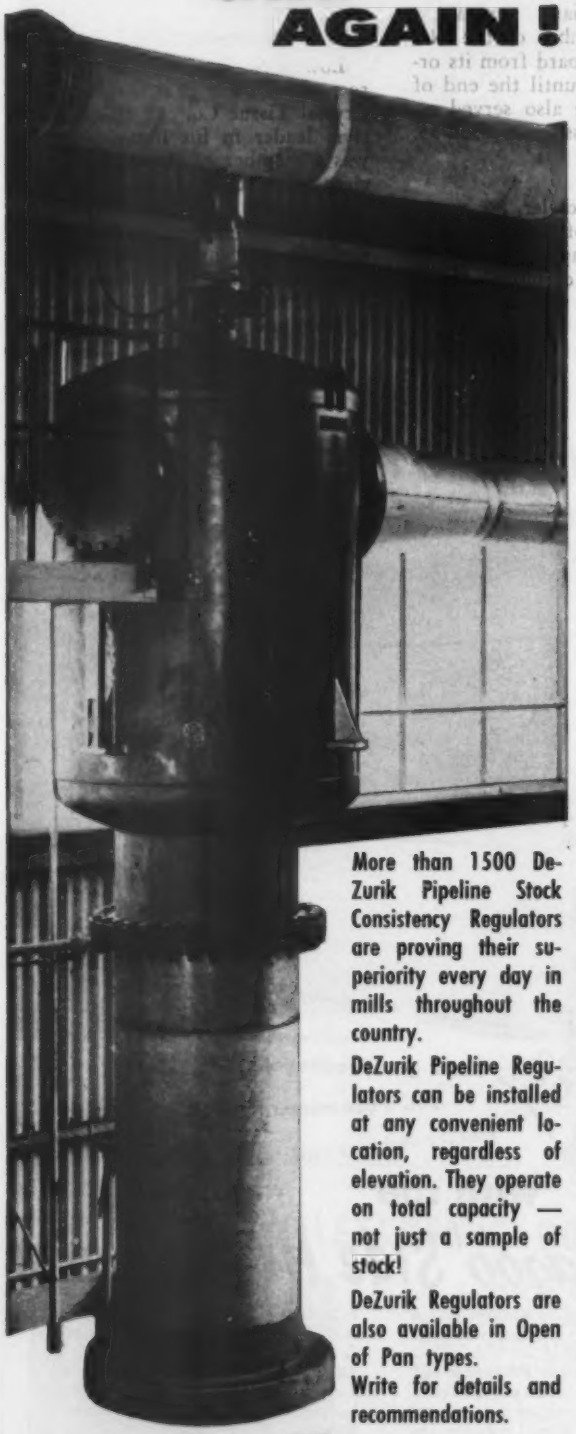

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FOREIGN ABSTRACTS

Microscopic examinations of fibers, paper, board and wood

This paper is the first of a series emanating from the British Paper and Board Industries Research Association. It describes improved methods for the study of fibrous surfaces.

These studies are based on the use of a directional, oblique deposition on the specimen of a very thin layer of metal. Actually, this is a metal shadowing technique, which over the year, has been in wide use in electron microscopy. When such shadowed specimens are photographed in the microscope, in transmitted light, they have the appearance of being illuminated obliquely. At the same time, the high resolution of the transmission microscope is retained.

Translucent specimens after shadowing may be examined directly, but there is some loss of resolution in the image due to scattering of the condensed illumination throughout the thickness of the specimen. For this reason, replica methods were devised so that shadowing could finally be "sandwiched" between two layers of appropriate plastics. In this way, the image contrast comes solely from the shadowing, and a clear and informative picture is obtained. This metal shadowing affords the best means of qualitatively evaluating rough surfaces in the light microscope.

For the best resolution and, especially, for surfaces of such opaque materials as wood and board, metal shadowing should be used in combination with the replica methods. For board and paper surfaces, the so-called "zero stage" method is the best [cf. Jayme and Hunger. *Monatshefte fur Chemie,* 87, 1 (1956)].

In the case of sections from wood, these can be replicated either by the zero method or by the two-stage replica, both of which are described in meticulous detail. Full details are also given regarding advantages and disadvantages in the techniques that are discussed.

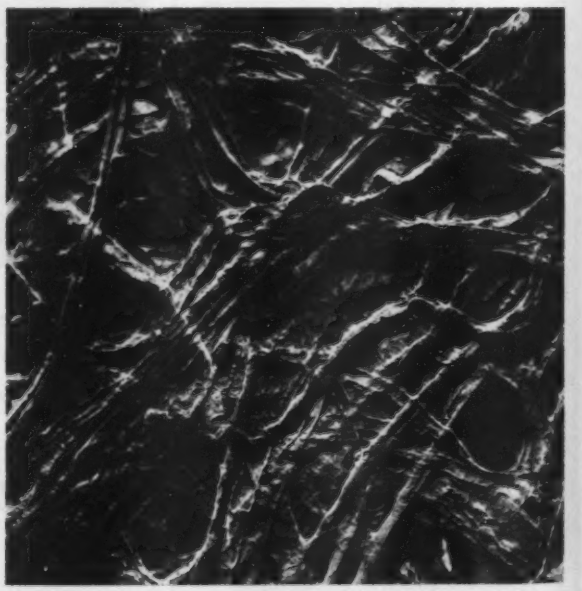


Fig. 1

Fig. 1 shows a zero-stage replica of the wire side of a kraft paper sheet. Here metal shadowing was layered between polyvinyl alcohol and polybutylmethacraylate. In two instances, a light micrograph in a certain area is compared with an electron micrograph of the same field.

Eighteen figures and 16 references are given. D. H. Page and H. W. Emerton. *Svensk Papperstidn.* 62, 318-332 (1959) (in English).

Silicones in paper sizing

A study was made, involving the substitution of silicones for rosin size. Un-sized paper was impregnated with .001- to 3-per cent triactoxysilane in organic solvents or with polyalkylhydroxysilanes (0.5 to 3 per cent) based on the weight of fibrous material in the form of aqueous emulsions.

In general, these gave good results, but in order to obtain a satisfactory degree of sizing, an additional heat treatment was required. This heat treatment could be omitted, provided the sheets were stored at room temperature for about 8 to 12 days or by the addition of suitable catalysts. Among these were sodium diethyl dithiocarbamate; potassium ethylxanthate; and the chlorides or acetates of cadmium, mercury, cobalt or nickel. In place of these, the addition of a melamine-formaldehyde resin to the silicone also served to hasten sizing.

The best results (without heat treatment or storage) were obtained by using a mixture of 0.5-per cent rosin size and a 1 per cent preparation of methylhydroxysilane (termed MN-1), followed by precipitation with 0.5-per cent alum and using sodium diethyl dithiocarbamate as the catalyst. Siloxane-sized papers showed an excellent retention of fillers.

N. A. Afonchikov, G. V. Kolobova, P. N. Mikhailov and M. G. Voronkov. *Zhur. Priklad Khim.* 32, No. 2,445-6 (1959) (in Russian); through *Abstr. Bull. Inst. Paper Chem.* 29, 1676-7 (July 1959).

Heat tempering of hardboards

A study was made of certain operating variables that influence heat treatment, termed "tempering," of hardboards. Any differences in hardboard strength that were found due to heating or to various pressing cycles appeared to remain even after the heating operation had been completed.

Differences in water sorption and swelling however were largely eliminated when the heat tempering was carried out at 170° C. for two or more hours. Whether or not two or three sheets were placed close to each other in the heating chamber had no material effect on the results achieved. The time of heat treatment, commonly used in hardboard manufacture proved to be a far more important factor.

Eleven figures and six references are given. O. Brauns and L. Osterberg. *Svensk Papperstidn.* 62, 351-54 (1959) (in Swedish with English summary).

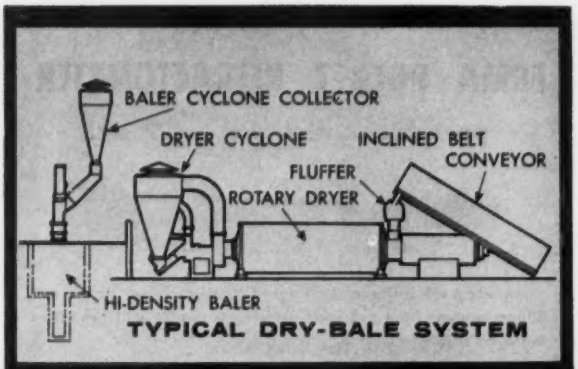
Influence of substitution on the "acidity" of cellulose

Changes caused by various substituents introduced into cellulose on the resulting (so-called) "acidity" were studied. Initially, the authors assumed that these changes were due to the influence of such substituents on the dissociation of those hydroxyl groups which remained unsubstituted. However, their data indicated that the nature of the cellulose derivatives was also dependent on other factors, such as the polarity of the groups directed outward from the molecule.

Cotton linters and regenerated cellulose were the two starting products. In forming the cellulose derivatives, those prepared from regenerated cellulose showed a slightly higher degree of substitution (D.S.) than those made from native cellulose, due to the higher accessibility of the former. Attempts were made to titrate the "acidity" in various non-aqueous solvents, using sodium methylate, sodium methanolamine, etc. The various differential and conductometric titrations proved rather unsatisfactory. Although cellulose nitrate and cellulose sulfate could, to a certain extent, be titrated, the former was partially saponified and the latter underwent complete saponification.

In a series of sorption experiments, the retention of vapors of ethylene diamine, pyridine, water, acetic acid and formic acid by various cellulose derivatives (and by the initial cellulose) was investigated. It was shown that the influence of substituents on the acidity of the cellulose resembled that manifested by similar (or related) substituents on benzoic acid. In the case of cellulose, the nitrate caused the greatest increase in acidity. Methyl and acetyl groups had the least effects. Cellulose nitrates had the greatest sorptive effects in the case of alkaline vapors. Methyl and acetyl cellulose sorbed acid vapors most strongly. The effects of D.S. of the cellulose was not too definite.

When one considered that sorption was caused by the activity



TYPICAL DRY-BALE SYSTEM

Halifax Power & Pulp Ltd.
dries groundwood pulp to 90% air-dry

Halifax Power & Pulp Ltd., using the Dry-Bale system, is now drying groundwood pulp at Sheet Harbor, Nova Scotia. The new system reduces shipping costs . . . saves storage space . . . permits pulp to be shipped to distant markets. The pulp is readily dispersible, requires less handling, and can be stored in warm climates.

An integral part of the new system is the Heil dryer. A stream of hot air carries the fluffed pulp through the dryer . . . fine fibers are quickly dried and carried away, while wetter, heavier fibers move more slowly for longer exposure to the drying medium. Result: uniform drying of all fibers.

Compound showering flights on each of the three drums eliminate surging and provide maximum utilization of the drying medium.

For descriptive literature on the new Dry-Bale system and the Heil dryer, write The Heil Co.

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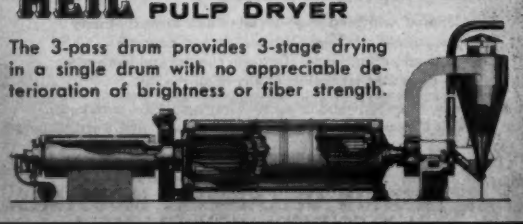
HEIL PULP DRYER
The 3-pass drum provides 3-stage drying in a single drum with no appreciable deterioration of brightness or fiber strength.


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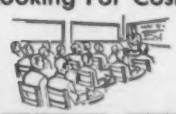

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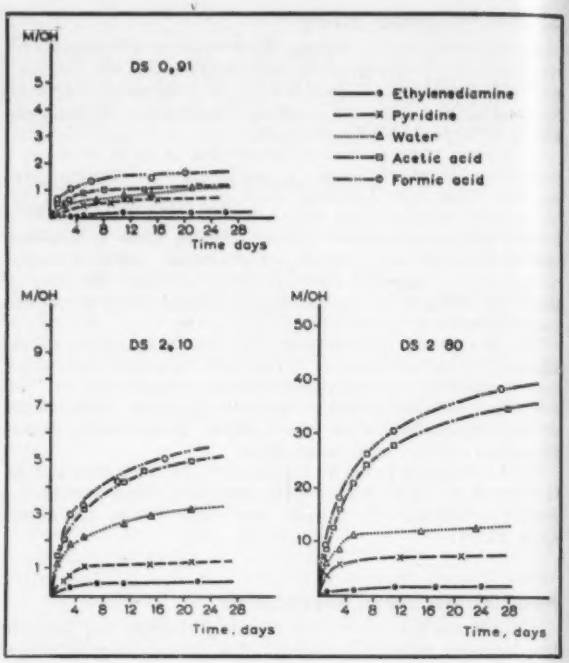


Fig. 2

of free hydroxyl groups, their activity appeared to increase with increases in the D.S. (cf. Fig. 2, in which the vapor sorptions by methylcellulose in moles per hydroxyl group are given). If however, the sorption values are given in terms of moles per glucose unit, the influence of substitution on the accessibility seems to be the decisive factor.

Thus, at small or large D.S. values, bases having relatively large molecules are often sorbed considerably less than at some intermediate D.S. value. In the latter case, the crystallinity of the cellulose derivatives seems to be at a minimum. The sorption of acids of low molecular weight is usually increased with increases in D.S.

Eleven tables, 16 references and 10 graphs are given. Ermo Kaila and Hannes Sihtola. *Paperi ja Puu* (Finland) **41**, Special No. 4a, 171-84 (1959) (in English).

Reducing the shive content of groundwood pulp

Mechanical pulp was cleaned by the use of a centrifugal cleaner equipped with a dilution nozzle, the operation of which is described.

The flow of dilution water was set at 20 lit. per min., although the actual capacity was up to 350 lit. per min. The flow used was compatible with that of normal mill operations. The cleaning was highly selective in removing shives; and with a fiber loss of only 2 to 5 per cent, the operation showed a marked improvement in pulp purity, as well as strength.

Screen rejects could also be cleaned by the centrifugal cleaner, when this was correctly applied, without the loss of pulp quality in the recovered fibers. The strength properties of the cleaned screen rejects (in the case cited) compared very well with those of commercial groundwood obtained from the same mill; often the strength properties were actually higher.

Freeness of the cleaned pulp was considerably higher than that which had not been treated. The experimental data confirm the hypothesis that the fiber fraction isolated from groundwood-screen rejects, has above average strength properties.

G. Gavelin. *Svensk Papperstidn.* **62**, 355-8 (1959) (in English).

Corrosion and fouling of black-liquor evaporators

Within the past several years, studies have been made by Mooch Domsjö Aktienbolag in Husum, Sweden—this is the fourth of their published reports.

Ordinary carbon steel, when subjected to the vapor from black liquor, was corroded due to oxygen entering during shut-downs. A more serious source was found to be due to leakages into the vacuum system during the actual operation of the evaporators.

In the absence of oxygen, the layer of corrosion products is a very thin film consisting of magnetite and iron sulfide (usually FeS_2). When oxygen is present, this layer builds up steadily in the form of reddish $Fe_3O_3H_2O$. After a shut-down, sulfates and free sulfur are probably also formed due to oxidation. Any type of organic deposits many emanate from lignin, precipitated from entrained black liquor.

Possible methods for cleaning the steam areas are outlined. The corrosion due to black-liquor vapor and its possible reduction are discussed briefly.

Twenty-three references and one figure are included. A. E. Venemark. *Svensk Papperstidn* 62, 381-9 (1959) (in Swedish with English and German summaries).

Weakly ethoxylated cellulose alkylated further

Both cotton and wood pulp of dissolving grade were mercerized by being treated with 17.5-per cent, followed by a treatment 50-per cent sodium hydroxide and then etherified for six hours with butyl, isobutyl and isoamyl and amyl halides, both with and without previous treatment with ethylene oxide. When this pre-treatment was made, it was carried out at 20° C. for 2 to 2½ hrs. This weak ethoxylation yielded alkali celluloses containing 6-to 13-per cent ethoxy groups.

The other respective alkoxy contents of the ethoxylated butyl, isobutyl, amyl and isoamyl celluloses were 36.2, 16.2, 24.3 and 13.6 per cent. When the preliminary ethoxylation was omitted, these percentages dropped respectively to 8.8, 4.5, 3.2 and 5.2 per cent.

When after the first treatment with alkali the products were treated with ethylene oxide, the percentage of other alkoxy groups that could be introduced was increased. Thus, the introduction of the theoretical of butyl groups rose to about 50 to 57 per cent alone by such treatment. Ethoxylated butyl cellulose showed higher mechanical strength than did ordinary butyl cellulose of the same degree of substitution obtained by etherification at 140°C.

The authors suggest that the lower mechanical strength properties of the usual butyl cellulose result from the degradation of the cellulose under the servere conditions of etherification.

Six tables and 14 references are given. N. I. Klenkova and O. M. Kulakova. *Zhur. Priklad. Khim,* 32, No. 3, 680-6 (1959); through *Abstr. Bull. Inst. Paper Chem.* 29, 1629 (1959) (original in Russian).

Speed differences on the paper machine

The speeds and differences in speed of the web on the papermachine have been viewed from the standpoint of practical papermaking using as an example a modern, high-speed newsprint machine. The authors discuss the factors affecting the stock-discharge velocity from the slice and the methods used in controling this velocity.

The conclusion is reached that the relative basis-weight variation (which equals the relative slice-discharge velocity variation) is equal to half of the relative headbox-pressure variation. The authors suggest reasons why differential speeds between various sections of the papermachine must be maintained.

Measurements of speed differences can readily be made by the use of a simple stroboscope. Examples are given of various instruments used in measuring speed. These include a simple pneumatic tensiometer, a DC tachometer system and an electric pulse counter. A newly designed AC tachometer system proved to be a simple, reliable and durable device for measuring speed differences.

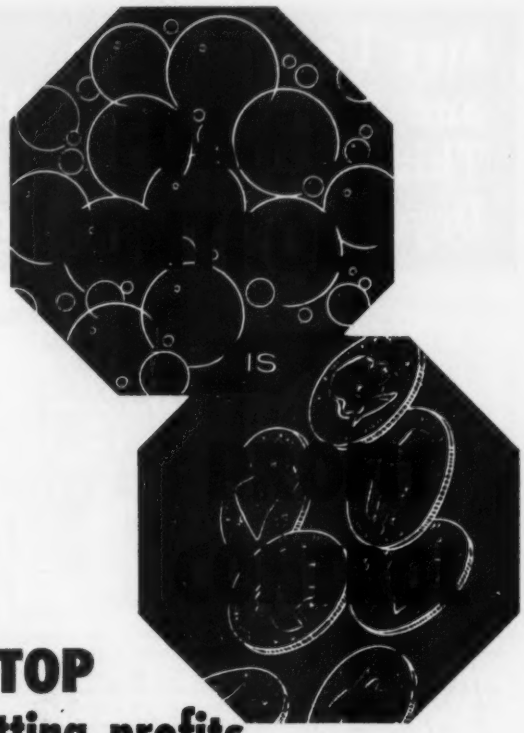
Eleven illustrations are included which have English and Finnish captions. K. Vesterinen. *Paperi ja Puu* (Finland) 41, No. 5, 261-270 (1959) (original in Finnish with English and German summaries).

Indian Institute of Technology

Recently, the cornerstone was laid for the second Indian Institute of Technology at Powel, about 20 miles from Bombay. Since 1951, the first of a group of higher technological institutes has been functioning at Kharagpur in West Bengal. The new institute will accommodate 1500 undergraduates and 500 graduate students and research scholars.

The U.S.S.R., acting through UNESCO, is contributing substantially to the new institute. Two other institutes will also receive considerable foreign aid.

The status of technology and research in India is described briefly. Anon. *Indian Pulp and Paper* 13, No. 10, 457-8 (1959).



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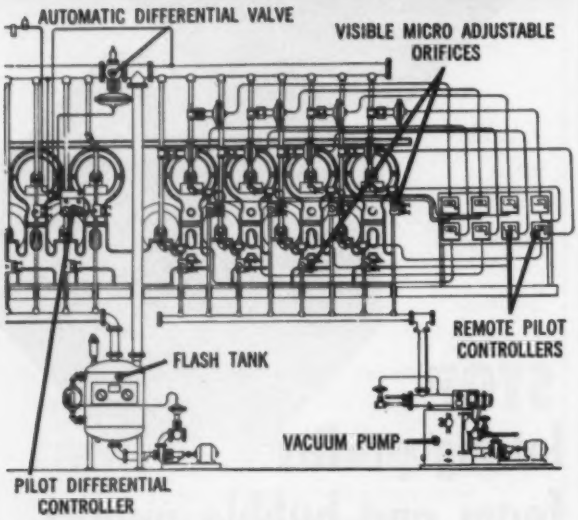
Step Up Production and Raise Quality with This New Differential Dryer Drainage System



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5. Visible micro adjustable orifices on each dryer replace expensive and hard-to-maintain steam traps; provide continuous visual check of flow of condensate leaving dryer. Available with or without indicating thermometer. Needle-point adjustment permits best setting for any pressure or size of dryer.

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Moisture Control Systems
Dryer Drainage Systems
Feed Water Heaters
Vacuum Pumps
Micro Adjustable Orifices
Differential Control Valves

Stickle Equipment
Cuts the cost of steam

PATENT REVIEWS

MELVIN NORD*

Manufacture of chemical pulp from highly resinous wood

U. S. 2,885,317, issued May 5, 1959, to Per H. Collin, Karl E. Eftring and John H. Jonsson and assigned to Stora Kopparbergs Bergslags Aktiebolag, describes a method for the manufacture of chemical or semichemical pulp from highly resinous wood.

The wood is first sulfited by steaming with an alkali or alkine-earth sulfite or bisulfite solution in a digester, filled with liquor under a hydraulic over-pressure of 14 to 112 psi. over the steam pressure. The temperature is increased continuously during the sulfiting period to about 135° to 140° C.

Then, after the withdrawal of the liquor, the sulphited wood is hydrolysed in a second step in order to dissolve the lignin sulfited in the solid phase, using sulphur dioxide in the liquid or the gaseous state.

Heating system for cellulose digestion plants

U. S. 2,886,483, issued May 12, 1959, to Curt F. Rosenblad and assigned to Aktiebolaget Rosenblads Patenter, describes a system for indirect heating of the digester liquid in the production of cellulose pulp.

A single heater is used to heat two digesters, one at a time. When digester A is being heated, for example, the steam passes through one side of the heater, and the digestion liquor being heated passes through the other side. When digester B is being heated, steam passes through the side of the heater which formerly contained digestion liquor, while digestion liquor from digester B now passes through the side of the heater which formerly contained steam.

Thus, the heating surface exposed to the digester liquid is cleaned with steam every time the valving is reversed. This inhibits scale formation on the heating surfaces.

Apparatus for removing pulp from a treatment vessel

U. S. 2,884,146, issued April 28, 1959, to Matti J. Jalkanen, describes a device for removing pulp from a treatment vessel.

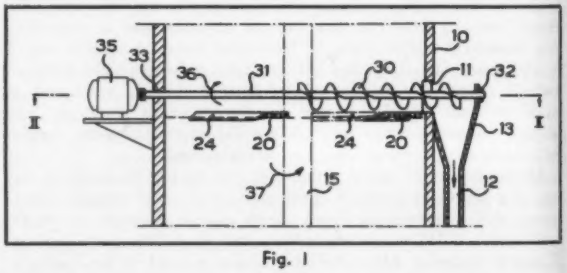

Fig. 1

As shown in Fig. 1, rotating-cutting means 20, attached to a shaft 15, are provided near the top of the tower 10; a conveyor 30 removes the cut pulp from the vessel into a downpipe 12.

With this arrangement, the pulp is removed evenly from the tower so that all portions of the pulp remain in the tower for substantially the same amount of time, thereby providing uniform pulp treatment. Furthermore, the power required to drive the cutting means is substantially less than that required to drive prior art-scraper devices.

Manufacture of wood fiber hardboard

U. S. 2,888,376, issued May 26, 1959, to Basil O. Stewart and assigned to National Gypsum Co., describes a process for the preparation of a dried, wet-formed mat of wool fiber prior to its consolidation by combined heat and pressure.

Raw wood chips are reduced to a size of the order of ¼ by

*Patent attorney, 17600 Pinehurst, Detroit 21.

¾ in. across the grain and ¾ in. with the grain. The chips are then subjected to a high temperature steam treatment to chemically convert some of the ingredients, principally the lignins, into a form in which they will subsequently provide a binder material in the consolidated board. The steam-treated chips are then reduced to fibers by defibrators having closely-opposed, oppositely-rotating discs. The fibrous material, dispersed in an aqueous slurry, is then formed into mats by a fourdrinier machine. The mats, still containing considerable water, are then squeezed by press rolls to reduce the water content and are then air-dried in a hot air continuous dryer to a very low water content.

The surfaces of the mats are then dry-heated, by conduction, convection, or radiation, to temperatures of 400 to 500° F. for very short intervals of time (e.g., one second), to convert a surface-migrated layer of wood sugar from an "A" stage in which it is liquid when hot, solid when cold, and soluble in a variety of solvents, to a "B" stage in which the material softens when heated but does not melt, will swell in solvents, but is insoluble in water.

Paper of high dry strength and low wet strength

U. S. 2,890,978, issued June 16, 1959, to Norman T. Woodberry, Sewell T. Moore, Yun Jen and assigned to American Cyanamid Co., describes a method of producing paper having improved dry strength but unimproved wet strength.

The process consists of forming an aqueous suspension of cellulose papermaking fibers, and uniformly distributing in it 0.1 to 5 percent (based on the weight of the fibers) of a cationic water-soluble polymer prepared by subjecting a water-soluble polyacrylamide (molecular weight about 10,000) to the Hofmann reaction until 0.1 to 15 percent of the amide groups have been degraded to amino groups. A polymer bond between the fibers is thus effectuated.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Apparatus for folding box blanks	Raymond A. Labombarde	2,883,916	4/28/59
Apparatus for folding trailing flaps	Leon E. La Bombard	2,883,917	"
Paper of improved dry strength	American Cyanamid Co.	2,884,057-8	"
Packaging cardboard for garment	Hyman D. Abbey	2,884,124	"
Carton	National Container Corp.	2,884,175	"
Closure method for fibre containers	Greif Bros. Cooperage Corp.	2,884,176	"
Carton	American Can Co.	2,884,178	"
Compartmented carton	Robert T. Rossum	2,884,179	"
Collapsible carton	Bloomer Bros. Co.	2,884,180	"
Carton for bottles	Federal Carton Corp.	2,884,181	"
Sleeve structure for bag valve	Raymond Bag Corp.	2,884,182	"
Moistening of paper in a closed chamber	Aktiebolaget Svenska Flaktfabriken	2,884,706	5/5/59
Bag-making machine	Roto Bag Machine Corp.	2,884,988	"
Molded pulp container	Paper Maid Inc.	2,885,135	"
Egg cartons	Jesse R. Grant	2,885,136	"
Stacking containers	Waldorf Paper Products Co.	2,885,137	"
Corrugated-board container	Waldorf Paper Products Co.	2,885,138	"
Corner protector	Fort Wayne Corrugated Paper Co.	2,885,139	"
Frozen-poultry container	Waldorf Paper Products Co.	2,885,140	"
Container with trough-feeding means	St. Regis Paper Co.	2,885,141	"
Wet-strength paper	American Cyanamid Co.	2,885,318	"
Packaging of books	Alton Box Board Co.	2,885,842	5/12/59
Device for forming spout structure in carton blanks	Flo-Seal Corp.	2,885,933	"
Cigarette paper	R. J. Reynolds Tobacco Co.	2,886,041-2	"
Container with collapsible tray	Aaron J. Katz	2,886,229	"
Container	Virgil E. Langley	2,886,230	"
Cartons	Aktiebolaget Akerlund & Rausing	2,886,231	"
Display and dispensing cartons	New Haven Board & Carton Co.	2,886,232	"
Dispenser package	Hilda Kessler	2,886,233	"
Reclosable cartons	New Haven Board & Carton Co.	2,886,234	"
Blank for bottle carrier	David Levkoff	2,887,245-6	5/19/59
End pad and corrugated container	Stone Container Corp.	2,887,263	"
Heavy-duty container for bulk material	Crown Zellerbach Corp.	2,887,264	"
Packing box for eggs	Jules Glaser	2,887,265	"

Counterboy

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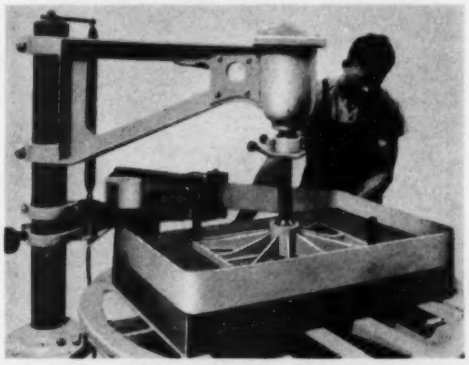

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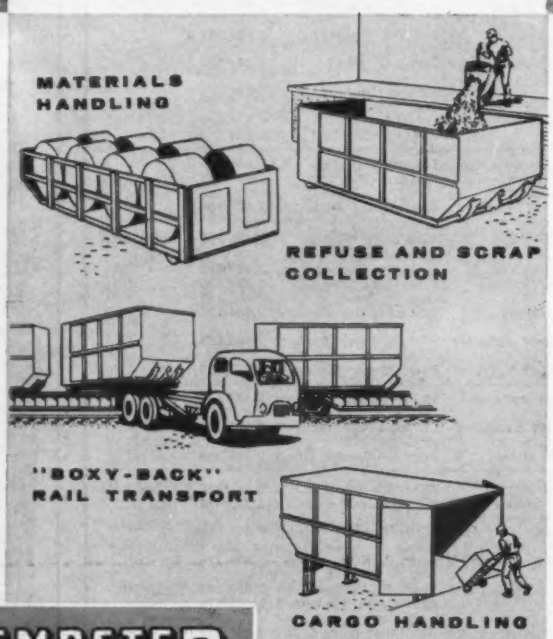

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NEW PRODUCTS

These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Hand speed indicator

The T-110 hand speed indicator, a combination of counter and stop watch movement starting and stopping simultaneously, can be used for speeds up to 6000 rpm on machines, motors, shaftings, etc. It has numerical readings and operates in either direction. Light weight — 8 oz. *Kernco Instruments Co. Inc.*

Circle No. 11 on Readers' Service Card

Titanium-clad pressure vessels

Titanium Hortonclad vessels, proved feasible through vacuum cladding and special welding, provide titanium's high corrosion resistance at considerably less cost than that of solid titanium structures.

Manufacturing procedures have been developed to prevent contamination of the titanium cladding by the steel backing plate; forming problems were solved and ways were found to vacuum-clad in titanium at sheet sizes comparable to sheets of conventional corrosion resisting metals. *Chicago Bridge & Iron Co.*

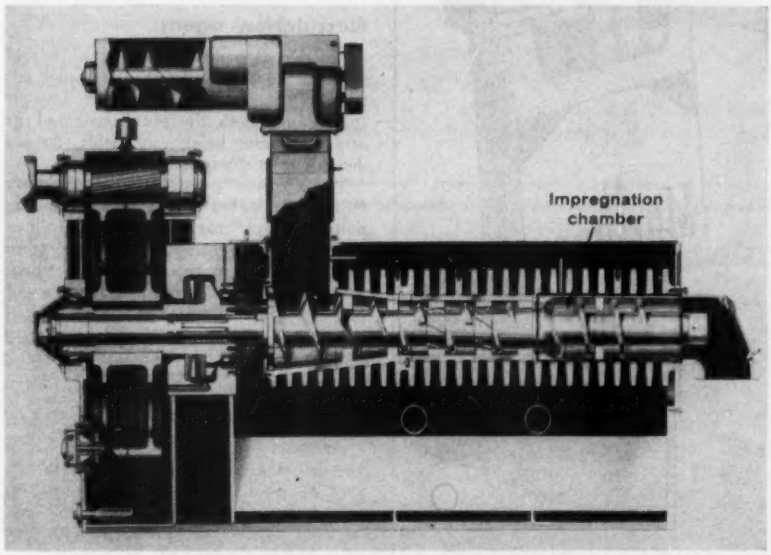
Circle No. 12 on Readers' Service Card

Automated water tester

The Mark II dissolved-oxygen recorder, said to furnish continual and accurate recordings of water's oxygen content, requires no attention and works 24 hr. a day, replacing as many as three technicians.

The tester, connected into one or several intake lines, draws in a pre-determined water sample, tests it immediately and records its findings on tape. In addition, the Mark II can be set to draw from pipelines in rotation, testing each source in turn and returning to the first source, continually repeating the cycle. As soon as each test record is made, the machine flushes itself out, cleans all parts and starts the next test; either from the same inlet or any other inlet pre-determined by the set-up.

Deliveries from the English manufacturer



Impressafiner

The Impressafiner is said to greatly reduce time for impregnation of wood chips and other cellulosic materials with cooking liquors. The unit can also be used for precise addition of bleaches and other chemicals, for restoration of moisture to sawdust, overly-dried chips, etc. In addition, fiber bonds can be softened, thus separating fiber bundles without breaking or shortening the length of individual fibers. Unit's daily capacity: 50 to 75 tons, depending upon operating conditions and the material being processed. *Bauer Bros. Co.*

Circle No. 13 on Readers' Service Card

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FELTS
The
WATERBURY Felt Company
SKANEATELES FALLS, N. Y.

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Jenkins' METLKOR Web Cleaning Brush of DuPont Tynex Nylon

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HERE'S WHAT THE DOWNINGTOWN PAPER BOX COMPANY SAYS: Mr. George J. Wolfer, Gravure Supt. says: "Jenkins' METLKOR brushes are contributing to the overall economy and quality that is so important to our production. When we reorder brushes, they will be Jenkins' METLKORS."

HERE'S WHAT THE MANUFACTURERS OF THE CHAMPLAIN INLINE GRAVURE EQUIPMENT, OF BLOOMFIELD, N. J., SAY: "The Jenkins' METLKOR brushes used in the web cleaning process of our Champlain inline gravure equipment are superior in performance and efficiency and are providing satisfactory and economical operation for our customers all over the world."

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New Products . . .

are expected early in 1960. *Chicago Apparatus Co., sole American distributors.*

Circle No. 14 on Readers' Service Card

Flocculation agent

Sedomax F, a new type of agent, is said to cause good flocculation and quick settling of finely-divided solids in aqueous suspensions. Both the pure agent and its dilute solutions being very stable, do not deteriorate in storage.

The company points out that Sedomax F may be added advantageously during pulp and paper manufacture at the following points: process water treatment; green liquor clarification; bleach liquor settling; white water clarification and retention of fines. *Arnold, Hoffman & Co. Inc.*

Circle No. 15 on Readers' Service Card

Sight glass indicator

An aluminum sight glass indicator (Model 640 Visi-Flow), used in gravity flow applications as a pipeline window, handles entrained solids, gasoline, oil, water or chemicals. A straight-through type with double windows of heavy plate glass on opposite sides with leak-proof gaskets, it is now available in sizes of ½ through 2 in. The indicator is suitable for pressures to 75 psi and temperatures to 225°F. *OPW-Jordan Co.*

Circle No. 16 on Readers' Service Card

Bearing takeups

Babbited and bronze-bushed bearing takeups are now available in 74 new sizes and 3 series. The new sizes include: Series AS 2600Z bronze bearing takeups for conveyor or elevator use where service is moderate; Series BS 2700Z bronze bearing takeups for moderate duty conveyors and elevators; and Series 3000Z bronze bearing takeups for moderate duty chain or belt conveyors or other special equipment. *Link-Belt Co.*

Circle No. 17 on Readers' Service Card

Do-it-yourself V-belts

Industrial users can now make their own V-belts in any desired length with the manufacturer's new rolls of popular-sized V-belting (cross-woven fabric construction), Alligator V-belt fasteners and simple application tools. *Flexible Steel Lacing Co.*

Circle No. 18 on Readers' Service Card

Valve for viscous media

The Gear-Vac handles small flows of viscous media (up to 250,000 SSU) and is said to produce almost absolute vacuum, causing atmospheric pressure to collapse the viscous mass into the vacuum pocket, providing a constant supply in the gear chamber for positive dispensing with metering accuracy within ±2 per cent.

With complete accessibility to bearings and gear train, the valve has a standard 150-lb. ASME 3-in. flange on suction side for connection to tank, reactor, etc. and a ¾-in. threaded discharge port.

The valves are available in type 316 stainless steel, Ni-Resist or aluminum; gears in stainless steel, Hastelloy C or B, Ni-Resist, Monel or nickel, with replaceable carbon or ceramic wear plates and carbon, self-lubricating bearings. *Eco Engineering Co.*

Circle No. 19 on Readers' Service Card

Static meter

The Model 250 has two full-scale ranges (both positive and negative) measuring 10 and 30 kilovolts when the detecting head is approximately ⅜-in. from the charged surface. At a 6-in. distance, static-charge voltages up to 100 kilovolts can be measured. Other features include portable battery operation and accuracy within 5 per cent.

Typical uses are measurements of electrostatic charges on plastics, paper, hydrocarbons and other poor electrical conductors. *Keithley Instruments Inc.*

Circle No. 20 on Readers' Service Card

Self-emulsifying pulp additive

WR-321 improves paper stock qualitatively by eliminating foam, improving ash, pick and other properties. Furnished in 100-per cent-active flake form, it is simply applied because of its ease of emulsification.

The additive, when agitated with warm water, melts rapidly to form a homogeneous emulsion which remains stable on further dilution.

It is said to aid fiber dispersion, improve sheet formation and drainage on paper machines. In addition to preventing foaming on wires, in the headbox and in cylinder machine vats, it is recommended for foam prevention in preparation of coating mixes and in de-inking operations.

Offered in unit-sized packages up to 50 lb., WR-321 is custom-packed in multi-wall kraft bags in the exact amount required by the user's process. *Hodag Chemical Corp.*

Circle No. 21 on Readers' Service Card

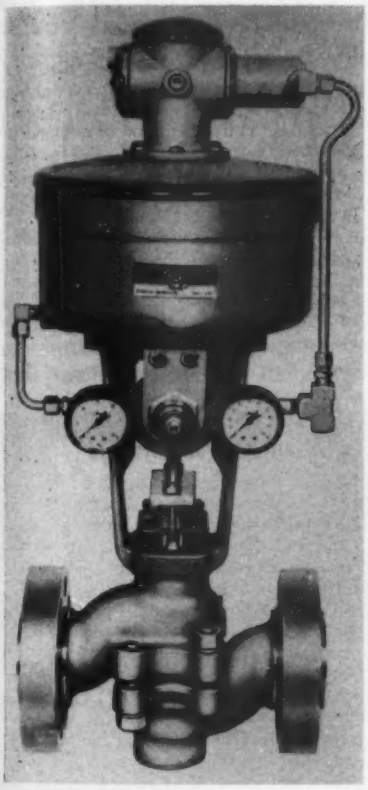
Electric vibratory feeder

An electro-permanent vibratory feeder, now available, is designed in a wide variety of types and strengths specifically adapted to the needs of many different industrial processes in which bulk materials must be efficiently and accurately conveyed, agitated and blended etc.

The lower tray of the feeder is especially designed to take variously-sized screens, ranging from ¼ in. to 1-¼ in., so that as the parts are vibrated toward the end of the screen, the sludge, rejects, mis-blanks, etc.,

drop through the screen to another vibrating tray that conveys them to a scrap bin. The perfect parts fall from the screen's end into packages, ready for shipment. *Eriez Manufacturing Co.*

Circle No. 22 on Readers' Service Card



Control valve

The modified Conoflow Series LB control valve with Model J positioner is applicable in many pulp and paper-making processes including sulfite acid preparation, digester and hot acid accumulation, blow tank heat recovery and black liquor evaporation.

The valve, of single-seated, split-body design with a powerful cylinder actuator, provides tight shutoff against high line pressures. A piston lipseal, assuring a bubble-tight seal and sensitive stroke, is an exclusive feature of the valve cylinder.

Available in sizes of ¾ through 6 in. with separable or integral flanges, the valves can be supplied in steel, bronze, ductible iron, Monel, nickel, aluminum and other castable alloys. Extra thick body walls meet 600-lb. ASA rating. (See further description on back cover.) *Conoflow Corp.*

Circle No. 23 on Readers' Service Card

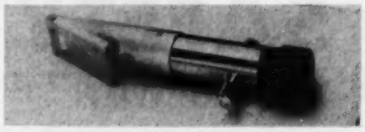
Diaphragm pump

A new diaphragm-type, controlled-capacity, chemical metering pump has been designed for positive-displacement metering of a wide range of corrosive and non-corrosive liquids. According to the company, the pump will satisfy high-accuracy, low-flow metering requirements with four flow ranges available up to the maximum of 2.5 gal. per hr.

Flexing fatigue and flow-rate distortion are eliminated by a hydraulically balanced Teflon diaphragm. The pump operates against back pressures as high as 500 psi. Wetted parts can be constructed of many materials, such as plastic, stainless steel, nickel, etc.

Construction includes a built-in, over-pressure relief valve. The totally enclosed operating mechanism is completely submerged in oil. The new diaphragm pump is available in multi-head construction and for automatic proportioning from a pneumatic- or electric-impulse signal. *CC Pump Div., Clark-Cooper Co., Inc.*

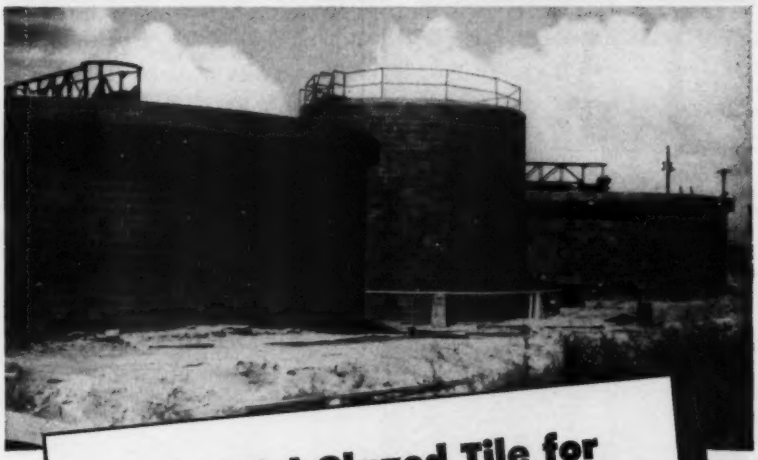
Circle No. 24 on Readers' Service Card



Light-weight pocket refractometers

This line of refractometers is described as easy to use and designed to give a quick

Effluent and Water Treatment Tanks



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and convenient means of determining sugar and starch content, total protein in serum and refractive index of liquids. Models available: 0 to 30 per cent; 30 to 60 per cent and triple range model (0 to 30 per cent, 30 to 60 per cent, 60 to 90 per cent) all in one instrument. Special "starch" model 0 to 27 per cent for sizing and starch content. Light weight—9 oz. Please see ad on page 590. *Kernco Instruments Co. Inc.*

Circle No. 25 on Readers' Service Card

Quiet pressure blowers

A new series of high-efficiency, large-capacity, quiet pressure blowers, equipped with airfoil blading, has 8000 to 64,000 cfm. at pressures from ¾ to 2¾ psig. They are well suited for product cooling, pressure or vacuum drying, liquid agitation, etc.

With quieter operation, the airfoil blading and scientifically designed aerodynamic flow passages through wheel and housing also give optimum performance with minimum power input, frequently permitting operation of the blowers with motors smaller than necessary with conventional flat-blade blowers.

The statically and dynamically balanced blower wheels are completely relieved of stress. A rising pressure characteristic and inlet air-spin control give stable air-volume delivery for normal operating ranges and at reduced loads. *Westinghouse Electric Corp.*

Circle No. 26 on Readers' Service Card

Speed reducers

An entirely new line of high-horsepower speed reducers is capable of transmitting as much as 80 per cent more horsepower above that carried by conventional worm gear units. The company is already producing smaller-sized speed reducers, ranging from 1-to 40 hp. The larger sizes are still in various engineering stages, with most models undergoing exhaustive testing. *Cleveland Worm & Gear Co., subsidiary of Eaton Mfg. Co.*

Circle No. 27 on Rearders' Service Card

Portable platform scales

A new line of portable platform scales features enclosed wheels for safety and cleanliness; an offset pillar for reducing overall width and increasing maneuverability; platforms which are completely free of checking; recessed counterpoise; self-aligning, hardened, tool-steel V bearings; and outstanding styling.

The scales are available in turquoise and black. They have a capacity of 1000 lbs.; 18- X 27-in. platforms; and are furnished with four different weigh-beam modifications—single-beam, drop-lever, double beam and duplex models. *Fairbanks, Morse & Co.*

Circle No. 28 on Readers' Service Card

Formable metal packing

A new formable metal packing, called Lonsor, is said to never deteriorate or harden.

Lonsor also eliminates the need for various sizes of packings. It comes in 1-lb. wrapped cakes and can be easily broken off and be stuffed into the box, gland or shaft by hand. Being pliable this metallic packing material conforms to the rod or shaft and makes a perfect bearing surface. Its inherent self-lubricating properties, derived from its antimony content, produces frictionless running.

Lonsor will withstand high pressures and temperatures to 700° F. It is impervious to water, steam, acids or oils. *Newage Industries Inc.*

Circle No. 29 on Readers' Service Card

UPVC-lined steel fittings

UPVC-lined steel fittings, in 8-, 10- and 12-in. sizes, alleviate mechanical stress problems and increase allowable pressure-temperature limits in the handling of corrosive fluids in large sizes of unplasticized polyvinyl chloride pipe.

Initial production includes 90° and 45° elbows, as well as tees with flanged ends or Victaulic-grooved ends.

The new fittings are rated for 190°F and 175-psi. test pressure, much greater than pressure-temperature ratings for manufactured UPVC fittings, claimed the company. They are also intended to overcome difficulties met in using fabricated fittings because of mechanical stresses met in lining up in the field.

The UPVC-lined steel fittings consist of light-wall carbon steel with a fabricated lining of 3/32-in. thickness UPVC. They match Schedule 80 UPVC pipe. The center-to-face and bolt-circle dimensions of flanges fittings correspond to ASA standard B 16.1. This material is designed to be used with solid UPVC pipe in schedules 80 and 120. *Tube Turns Plastics Inc.*

Circle No. 30 on Readers' Service Card

Cutting and creasing press

A new 42 × 62 corrugated and solid fiber cutting and creasing press, known as the Bobst SPO 1575 Autoplaten, offers press speeds up to 4500 sheets per hr. The special new model comes without stripping stations, although it can accommodate one or two of them, anytime.

The new press features a pivot-in-place cutting chase, which can be pulled out horizontally and turned over for easy access for makeready without removing the chase from the press.

Cutting, creasing and stripping makeready can be performed away from the press while another job is running. The makeready can be saved and replaced in

.. Fluid Power news

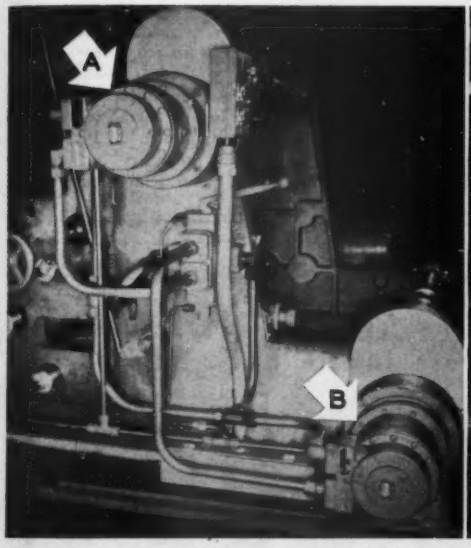
REPORT No. 12,300 HIGH PERFORMANCE WINDER DRIVES

From Oilgear Application-Engineering Files

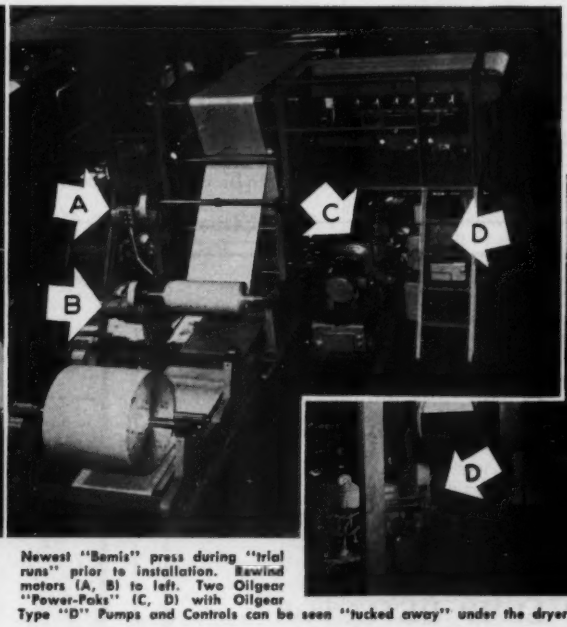
HOW OILGEAR PROGRESSIVE ENGINEERING PACES IMPROVEMENTS ON "BEMIS" MACHINES

CUSTOMER: *Bemis Bro. Bag Company, St. Louis, Missouri*

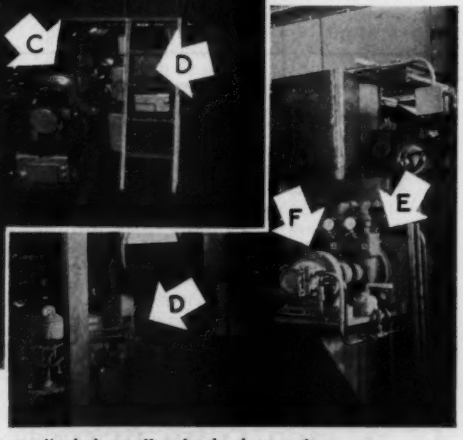
DATA: To efficiently produce the wide scope of paper, cloth, and polyethylene "Flexible Packaging" for which they are famous, "Bemis" designs and builds their own production machinery. Basically, "Bemis" machines are roll-fed, multi-color printing presses capable of very close register . . . operating from inching speeds of 15 fpm to running speeds of 400 to 1000 fpm. Press runs range from 1000 to 1,000,000 bags. Being roll-fed presses, winder drives and controls were a major problem, as ratios of 5:1 up to 10:1 from core to finished roll diameter are not uncommon. Paper widths vary from 10" to 56", with roll weights from 1000 to 2000 lb. "Bemis" specified that their winder drives must be compact; easy for shop, maintenance, and operator personnel to adjust, maintain, and understand. All electrical controls must be simple, with standard components preferred. Each machine to have one main control panel, and three or four remote, push-button panels — with some constant indication of load and tension as a desirable feature. Long, trouble and maintenance-free life was also of prime importance along with ease in installation.



Close-up of face-mounted, Oilgear Type "H" Fluid Power Motors (A, B), geared to rewind spindles of newest "Bemis" machine, shown center. Oilgear Type "D" Pump on "Power-Pak" (C) — center photo — supplies Fluid Power for rewind drive.



Newest "Bemis" press during "trial runs" prior to installation. Rewind motors (A, B) to left. Two Oilgear "Power-Paks" (C, D) with Oilgear Type "D" Pumps and Controls can be seen "tucked away" under the dryer section.



View "around-back" of new "Bemis" press dryer section, showing Oilgear Type "D" Pump and Controls on "Power-Pak" (D) which supplies Fluid Power to Oilgear Type "H" Motor (E) for main press drive. See "Note" below on Oilgear Pump (F), direct-coupled to tail-shaft of Motor (E).

SOLUTION: Through a program of constant improvement and engineering teamwork, Oilgear *Fluid Power* Drive and Control Systems have so successfully paced requirements for more efficient production equipment that "Bemis" plants in 16 cities now have 48 machines equipped with Oilgear winder drives. Dancer roll controls are used on 39 . . . 9 more recent installations have "*HYTAC SYSTEM" drives. Two newest machines (one shown above) have Oilgear Type "D" electrohydraulic servo controlled main press drives, and hydraulic servo controlled winder drives. One reason for this ever-increasing use of Oilgear "Any-Speed" drives has been clearly stated as follows: *"We put them in and forget about them . . . some have been operating for over 11 years without service or repair — many loaded to maximum capacity — others have had no oil change in five years"* . . . proof of the statement heard in all industry — *"For the lowest cost per year — it's Oilgear!"* One "Bemis" installation using a HYTAC SYSTEM winder drive handles 40 to 70-lb kraft stock 26" to 63" wide. This winder operates over a 13:1 ratio — from 3¼" diam. cores to 43½" diam. rolls — is limited only by interference on the machine. Of this HYTAC SYSTEM, "Bemis" states — *"Other types of variable speed drives could never do this . . . operating beyond our fondest hopes."*

*HYTAC SYSTEMS — An Oilgear Trademark

NOTE: *An unusual installation feature is partially visible on photo above. Oilgear Type "H" Fluid Power main press drive motor (E) is also direct-coupled to Oilgear Type "H" Pump (F) which supplies Fluid Power to an Oilgear Type "H" Motor — not shown — that drives the dryer fan.*

USER REPORTS — *" . . . exceptionally fine acceleration control . . . smooth creeping and inching speed up to maximum . . . exceptionally smooth running speed . . . are easier to adjust than other drives . . . require less space . . . pressure gage shows load while drive is in operation . . . maintain an adjustable tension from constant tension to constant torque."* "Bemis" — like other users — has found that Oilgear Drive and Control Systems give them constant tension, automatic tapering tension, stall tension, constant torque, automatic tapering torque, or a combination of tension and torque characteristics to meet their every production requirement.

For practical solutions to YOUR linear or rotary Controlled-Motion problem, call the factory-trained Oilgear Application-Engineer in your vicinity. Or write, stating your specific requirements, directly to . . .

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Application-Engineered Controlled Motion Systems

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New Products . . .

the press in perfect register for reruns.

SPO 1575 handles corrugated stock of up to ⅜ in. and fiberboard in all normal thicknesses. Either a .937- or 1⅛-in. cutting rule can be used without crushing the stock. *Thomson-National Press Co. Inc.*

Circle No. 31 on Readers' Service Card

All-AC motor drive system

A new all-AC motor drive system for the paper, plastics and textile industries, provides variable speed for power applications involving coating, laminating, drawing, embossing, bleaching, dying, etc.

Called U. S. Varidyne, the range drive combines the simplicity and flexibility of standard 60-cycle AC motors into a tightly coordinated system that delivers variable speed operation with line-shaft stability. Varidyne, through frequency variation of standard three-phase current, controls the speed of standard AC slave motors.

Now, costly power installation, elaborate control panels and specially trained personnel to repair or maintain the equipment are not needed. *U. S. Electrical Motors Inc.*

Circle No. 32 on Readers' Service Card

Packaging adhesive

A new packaging adhesive for adhering polyethylene and waxed paper, is designated as JAVATEX. It can be applied by machine or spray, has quick grabbing qualities, is permanently flexible, shock resistant and can withstand extremes in temperature.

JAVATEX is also ideal for bonding wax-surface packages, used in the meat-packing industry; bonding polyethylene to paper, chip board and kraft board.

Combination bags of polyethylene and paper can be made with JAVATEX, which is available in different viscosities for side seams and bottom seams. However, it will not bond polyethylene to itself. The transparent drying adhesive does not leave any residual odor. *Java Latex & Chemical Corp.*

Circle No. 33 on Readers' Service Card

Vapor condenser

A new and economical 2600 sq. ft. O.D. vapor condenser, which reclaims valuable heat from spent sulfate black-liquor vapors, is now being built for a pulp and paper mill in Brazil.

The vapor condenser is designed to condense distillation products out of a hot vapor line from a multiple-effect evaporator. At the same time, the heat of these vaporous products is transferred at the rate of over 19 million B.T.U.'s per hr. to incoming fresh water in the condenser tubes, preheating it by 25 to 30°.

A tubular exchanger is required because the presence of non-condensable sulfides in the vapor from the evaporator prevents the direct-injection method of preheating the incoming water. Since these non-condensables are corrosive to ordinary tubing materials, Type 304 stainless steel is used. *Alloy Tube Div., Carpenter Steel Co.*

Circle No. 34 on Readers' Service Card

Synthetic grease

Anderol L-237, a new synthetic grease for valve-type applications, is completely resistant to water, solvents and gasoline. Of medium-hard consistency it resists wipe-off and throw-off on valve applications. Its inherent stability resists mechanical breakdown over a temperature range from -20° to 300° F.

Like all other Anderol lubricants, this new synthetic grease is engineered with specific properties required to do a specific job. These built-in properties include a low rate of evaporation which maintains

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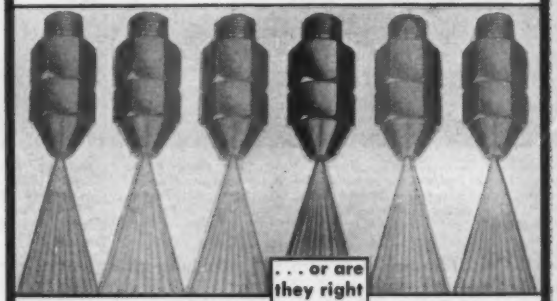
Are the SPRAY NOZZLES you use in the grey zones . . .



Like an electronic system, a spray nozzle system can be *tuned* for maximum performance. To do this select spray nozzles that *exactly* fit the system needs . . . in terms of capacity, spray characteristics and materials. The use of Spraying Systems spray nozzles keeps spraying installations out of the costly grey zones. The reason: you have a choice of over 12,000 *standard* nozzle types and capacities to match the nozzles exactly to your need.

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the effective life of the products up to 100 times longer than petroleum-based greases. The grease seeks out the metal and covers it with a film that acts as a protecting seal against humid and salt conditions.

Suggested applications for Anderol L-237 include fuel systems, couplings, plug valves, gate valves, etc. *Lehigh Chemical Co.*

Circle No. 35 on Readers' Service Card

Induction voltage regulator

A new rack-mounted induction voltage regulator, of compact 19-in. rack design can handle both single-phase loads of up to 8.5 kva. and 100 amps.

Available in either automatic or motor-driven models, the induction voltage regulator, tradenamed Inductrol, features no brushes, introduces no harmful wave-form distortion and is unaffected by power factor, frequency or load. Driftfree controls maintain ±1-per cent bandwith accuracy over a temperature range of −60 to +60° C. *Voltage Regulator Product Sect., General Electric Co.*

Circle No. 36 on Readers' Service Card

Continuous liquid-level measurement

In the new ultrasonic method, tradenamed Metasonic, liquid levels are precisely and continuously measured in liquid nitrogen, many slurries, thick oils, fused salts, molten metals, etc.

Liquid temperatures have ranged from cryogenic levels to molten metals. Almost any fluid pressure can be accommodated. Output of the fully transistorized measuring system is either digital or continuous and is adaptable to recording and control, proportioning and blending.

The new Metasonic principle uses solid-metal acoustic wave guides to obtain its information. Essentially, the effect of the liquid and its properties on the accuracy of level measurement is ignored or cancelled. *General Ultrasonics Co., a div. of Acoustica Associates Inc.*

Circle No. 37 on Readers' Service Card

Automatic trace material analyzer

The self-cleaning, simple-in-design AutoAnalyzer is said to incorporate the solution to most of the problems that limit the range and effectiveness of other analytical systems.

Modular construction of the various AutoAnalyzer units (sampling, metering, mixing, reaction, analysis) permits complete flexibility in arrangement for plant or laboratory use.

The proportioning pump can handle up to eight reagents simultaneously, analysis results are plotted continuously (colorimeter readings) on a Bristol-recorder strip chart and neither sample preparation nor maintenance is required. *Technicon Controls Inc.*

Circle No. 38 on Readers' Service Card

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Automatic stripping

The Bobst die cutting and creasing autoplaten, described as capable of automatic high-speed stripping of interior and exterior waste, is available for either folding box (SP series) or corrugated-solid fibre (SPO series) die cutting.

The company reports full press speeds of 4500 sheets per hour on single stripping station models (folding-box presses) and 30 by 42 models (corrugated-solid fibre presses. The larger 42 by 62 corrugated presses with either one or two stripping stations can attain speeds up to 3600 sheets per hour. Front, side and interior waste down to 3/32-in. slots and 3/16-in. diameter holes can be stripped without speed reduction. *Thomas-National Press Co. Inc.*

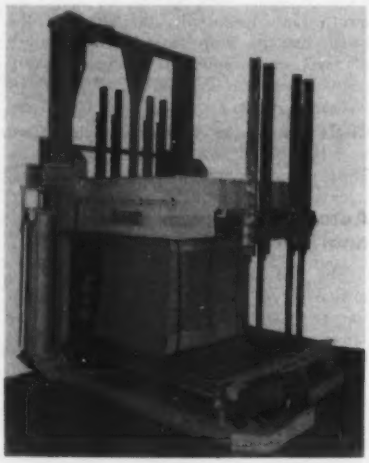
Circle No. 39 on Readers' Service Card

Paper softener

Cellolube Q-2, said to have a remarkable softening effect when added to furnishes used for napkins, towels and tissue, is usually added to slush stock at concentrations of 0.1 to 0.5 per cent, based on dry fiber.

Sheets softened with Cellolube Q-2 have shown the following properties: no decrease in tensile strength; improved sheet formation; an increase in CD tensile strength; better crepe; rewetting properties are not effected; no decrease in brightness on white stock; brighter shades are produced on dyed stock; and machine speeds are maintained. *Tanatex Chemical Corp.*

Circle No. 40 on Readers' Service Card



Compression strapping machine

The CSM compression strapping machine is said to simplify, automate and speed up steel-strapping operations; it compresses the load, feeds, tensions and seals the strap automatically.

The machine is available with platen pressures from 6,000 to 16,000 lbs. and a choice of pneumatic or hydraulic systems. *Signode Steel Strapping Co.*

Circle No. 41 on Readers' Service Card

Centriscreens

The availability of two pulp and paper screening units, known as Centriscreens, has been announced.

The Model 14 is a totally enclosed pressure screen that handles up to 5600 gals. or more of stock per minute.

The Model 10, about half the size of Model 14, handles about half as much stock. Its screening efficiency is just as high and it performs equally well. The smaller model is said to be ideal for use on small fourdriniers and on cylinder machines calling for one screen per mold. *Bird Machine Co.*

Circle No. 42 on Readers' Service Card

Strip-stamp adhesive

Sold in 5-, 30- and 55-gal. quantities, Cascorez CV-772 is available in ready-to-use form.

The company reports that this adhesive works equally well on a wide variety of surfaces including plastic, metal, paper and glass. Although designed specifically for strip-stamp operations, it has many other end uses. *Borden Chemical Co.*

Circle No. 43 on Readers' Service Card

HOW MANY WAYS CAN A
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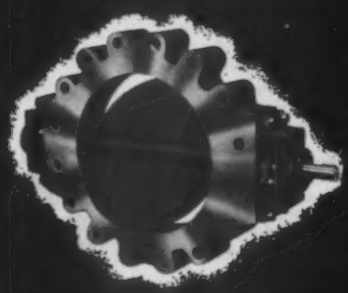

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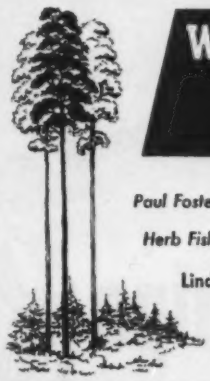

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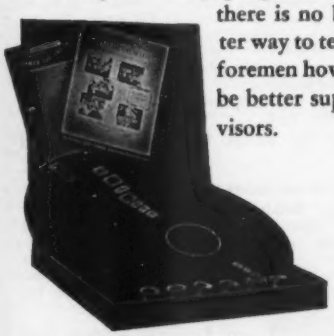

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This is a series of six 35mm sound slidefilms with leader's manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train workers, how to keep experienced people on their toes and how to win respect, cooperation and loyal support.

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A set of ten 35mm sound slidefilms—all that is needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities, such as machine guarding, safety inspections, the first aid program, etc. Complete with leader's manual in an attractive leatherette case.

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NEW LITERATURE

Books

NATURAL AND SYNTHETIC FIBERS YEARBOOK (1958), edited by Milton Harris and H. Mark. Issued with the cooperation of Harris Research Laboratories, Washington, D. C., and the Institute of Polymer Research, Polytechnic Institute of Brooklyn. Published by Interscience Publishers, 250 Fifth Ave., New York 1.

This new convenient-size edition is said to provide the essential literature on natural and synthetic fibers for 1958. It consists of full abstracts which originally appeared monthly in loose-leaf form. Beginning in 1954, these successive yearbooks reportedly cover the entire field of natural and synthetic fibers.

Every original contribution in the field (appearing in domestic and foreign journals) is represented by a full abstract; and in almost all cases, the original journal paper need not be consulted, add the publishers.

METALLIZING HANDBOOK (Vols. 1 & 2), by H. S. Ingham and A. P. Shepard. Published by Metallizing Engineering Co. Inc., 1101 Prospect Ave., Westbury, Long Island, N. Y. Price: $5.00 (clothbound) postpaid.

This completely new metallizing handbook contains 345 pages of "how-to" information, including the latest developments in the spraying, in powder form of high melting point ceramics, such as alumina, zirconia and hard-facing alloys including tungsten carbide.

The handbook is profusely illustrated with pictures, diagrams, charts and tabulated engineering data. It is said to be an invaluable reference for anyone concerned with product design, materials engineering, machine maintenance, corrosion protection of iron and steel structures and exposed equipment.

Booklets

WATER SUPPLY SYSTEMS (PB 1516-16), 118-page manual (revised Feb. 1959), prepared by the U. S. Navy Bureau of Yards & Docks, is now available to private industry. It covers the requirements and sources for a satisfactory domestic and industrial water supply; and deals with the design and construction of water-supply systems, including source structures, treatment plants and distribution facilities. The manual also outlines the conventional methods of water treatment and contains information on different types of plants. Also discussed are waterworks and their management, waste and leakage, repair and upkeep, laboratory control and safety practices. Copies may be ordered from the Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Price: $2.50.

1959 PRICE LIST SUPPLEMENT, has recently been published by Bulkley Dunton & Co., Div. of Carter Rice Storrs & Bement Inc. The new edition contains complete and up-to-date prices on papers for printing, publishing, business, advertising and industry. Also included is a Hammermill Graphicopy Insert which covers a complete line of papers for printing duplicating and office use. Available from the Sales Promotion Dept., Bulkley Dunton & Co., 295 Madison Ave., New York 17.

USDA Reports

CATALOGUE, The Forest Products Laboratory, Forest Service, U. S. Dept. of Agriculture, has issued its semi-annual list of publications (Jan. 1 to June 30, 1959). All publications are listed according to subject matter. This catalogue may be obtained by writing to Forest Products Laboratory, Madison 5, Wisconsin.

FOREST PEST LEAFLETS available from the U. S. Dept. of Agriculture Forest Service. No. 35 discusses pitch canker of southern pines; No. 38 discusses heart rots of Appalachian hardwoods; and No. 39 discusses the Pine Root Collar Weevil. Copies may be obtained by writing to the Superintendent of Documents, U. S. Govt. Printing Office, Washington 25, D. C. Price: 5c each.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

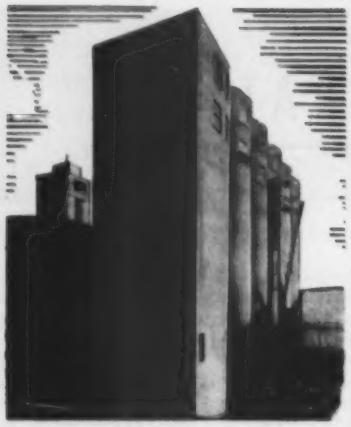
Dow products

Dow Chemical Co. has just published their 1959-60 general catalog. The catalog, 44 pages, lists properties and uses of 375 industrial, pharmaceutical and agricultural chemicals—both established products and developmental items. A section on plastics and coating products, and new sections on oxazolidinones, automotive chemicals, textile fibers and the company's Dowell Division are included.

Circle No. 44 on Readers' Service Card

Spring clutches

The Marquetee Div., Curtiss-Wright Corp., has published a new catalogue describing five standard lines of spring clutches in bore sizes from ⅛ in. to 1 in. and torque capacity up to 1250 lb.-in. They are specifically designed for



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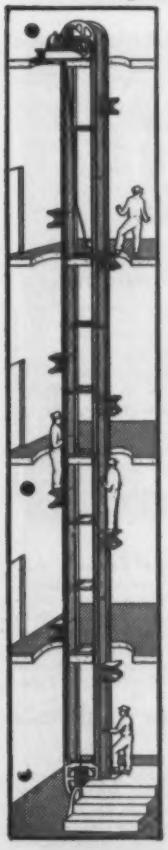

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Humphrey is the original Manlift Elevator, made continuously since 1887.

use in machinery, equipment and instrument applications using drive up to 5 hp. The catalogue lists specifications of each clutch and has technical and application data with illustrations to aid selection of the correct type and size of each series for the required application.

Circle No. 45 on Readers' Service Card

Helical gear speed reducers

Link-Belt Co. has published a new twenty-page book giving data on their In-Line Helical Gear Speed Reducers. The book provides complete selection data on 20 reducer sizes in double, triple, and quadruple reductions, tables of load classes and service factors, horsepower and torque ratings, dimensions, overhung load for high and low speed shafts, and mounting arrangements with construction feature resumes. Selection information on motor couplings and geared flexible couplings is also included.

Circle No. 46 on Readers' Service Card

Piping wall chart

Lunkenheimer Co. has published a 17- by 22-in. wall chart, useful for installation and maintenance personnel and individuals requisitioning valves of all types. The chart, divided into five convenient sections, has added features on the back as follows: illustrations of the company's line of valves, engineering specialties and lubricating devices.

Circle No. 47 on Readers' Service Card

Laboratory refiner

Sprout, Waldron & Co., Inc., has published an illustrated bulletin, on a new type laboratory refiner. It is a compact single disc swinghead precision built pulp refiner. Schematic drawings show three different methods of feeding the refiner; engineering drawings, basic construction and dimensions; installation photographs, various methods of mounting; and close-up shots, design and construction features.

Circle No. 48 on Readers' Service Card

Dry fluid drive

Dodge Mfg. Corp. is offering a bulletin on its dry fluid drive, tradenamed Flexidyne. The 23-page bulletin contains numerous photos, diagrams, and tables to explain the features of this controlled acceleration and torque-limiting device.

Circle No. 49 on Readers' Service Card

Wind and unwind equipment

Dilts Div., Black Clawson Co. Inc. has published two new specification sheets outlining the latest developments in the company's rotating wheels. The specification sheets feature the company's Model-10 unwind unit for continuous operation and the Model-10 winder for continuous center winding. Both sheets mention the important features and specifications of the equipment and contain many diagrams.

Circle No. 50 on Readers' Service Card

Materials handling folder

Whiting Corp. announces the availability of its new colorful folder which shows how Whiting Trambeam overhead equipment speeds materials handling and increases plant capacity at Automatic Electric's new 35-acre plant in Northlake, Ill. Photographs in full color will take the reader on an idea-packed tour of the plant.
pounds, etc.

Circle No. 51 on Readers' Service Card

Centrifugal pulp screens

Improved Machinery Inc. has issued a new bulletin on its Impco centrifugal pulp screens. This eight-page bulletin discusses the pulp screen's features and applications with many detailed diagrams and photographs.

Circle No. 52 on Readers' Service Card

Instructors' manual

Automatic Transportation Co. has published a new instructors' manual to be used as a guide for industrial truck operators' training programs.

The Paper Industry

Professional and Business Services

J. E. SIRRINE COMPANY

ENGINEERS Since 1902

GREENVILLE, SOUTH CAROLINA

Design — **Consultations**
Paper & Pulp — **Reports**
Water & Waste — **Appraisals**
Steam & Hydro Power — **Steam Utilization**

This new 20-page booklet is divided into six stages—theory of operation; good driving practices; construction details in principal types of trucks; pratical operation of the truck; demonstration and written examination for the driver trainee. Photos of Automatic's industrial trucks are shown to illustrate construction details of each particular model. Cartoons are also included to show how accidents happen and how to prevent them.

Circle No. 53 on Readers' Service Card

Ready-to-use mortar

Master Builders Co.'s new four-page, illustrated bulletin explains the best method of achieving tough, strong, non-shrink, water-resistant joints and masonry repairs by using Embeco Pre-Mixed Mortar. Also included in the bulletin are comparative compressive-strength test results.

Circle No. 54 on Readers' Service Card

Polyester resin

Atlas Powder Co., has two bulletins available that describe the properties, applications, and a room-temperature curing system for Arlac 382, a polyester resin. The bulletins will be of interest to industries faced with problems of physical, chemical, or electrical failure in equipment as a result of elevated temperatures or corrosion. The 12-page bulletin contains detailed instructions on using the resin with pertinent graphs and tables. The 11-page bulletin contains information on the room-temperature curing system with supplementary graphs.

Circle No. 55 on Readers' Service Card

Conversion chart

Precision Equipment Co. has printed a new wall chart of conversion factors, said to be useful for engineers, shop men and other executives. The chart includes common conversions, such as inches to centimeters or watts to horsepower. It also has many conversions that are difficult to locate in reference manuals like atmospheres to kilograms per square centimeters, centimeters per second to miles per hour, cubic feet to liters, microns to meters, quintal to pounds, etc.

Circle No. 56 on Readers' Service Card

Turbine pumps

Aurora Pump Div., New York Air Brake Co., has an eight-page bulletin available on the latest features incorporated into their Apco turbine type pumps. The bulletin includes exploded views, selection tables, limitation charts, dimensions, construction specifications and detailed engineering-architects specifications. This line of pumps is especially adapted to applications such as: boiler feed, condensate return, fresh water service, brine service, ice water circulation, filter service, caustic liquid service, etc.

Circle No. 57 on Readers' Service Card

CLASSIFIED ADVERTISING

CHEMIST
CHEMICAL ENGINEER
OR
PULP AND PAPER TECHNOLOGIST

We have an opening in our pulp manufacturing department for an experienced chemist, chemical engineer or pulp and paper technologist, pulp and paper manufacturing experience desirable. This is a position of responsibility with room for advancement. Starting salary based on experience and qualifications. All applications will be held in strict confidence. Please submit summary of educational background, experience, and salary requirements to:

EMPLOYMENT OFFICE
THE CHAMPION PAPER AND FIBRE COMPANY
CANTON, NORTH CAROLINA

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Your phone call, wire or letter will bring prompt attention. LIberty 2-6547 — 294 Washington St. — Boston 8, Mass.

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FOR SALE to the highest offer, Three (3) Pusey & Jones — Goldsmith Stream Flow Vats for use with 48" x 90" Cylinder Molds. Inner Circle completely adjustable, vat ends of cast iron, circles — brass. Reply to Box 691, The Paper Industry.

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WHEN YOU USE
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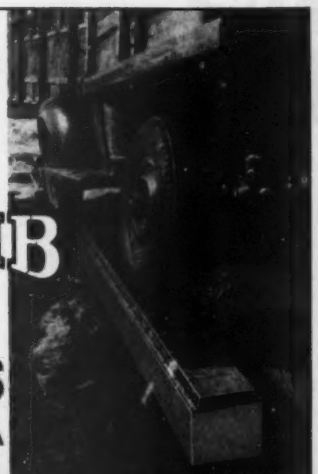
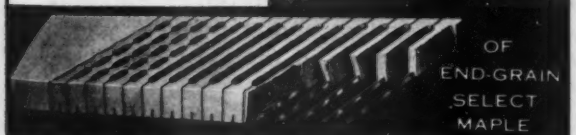
SUCTION BOX COVERS

YOU COULD DRIVE A TRUCK ON A MET-AL-RIB COVER



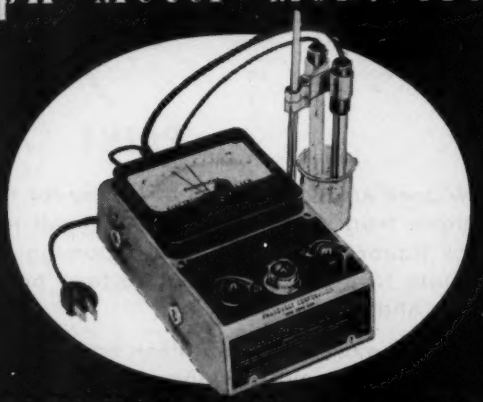


This Long-Life Suction Box Cover reduces operation costs — is stronger — eliminates sagging and breakage; it provides the lowest cost per ton of paper produced. There is a design to suit your particular water removal problem. Reinforced with stainless steel bar. Shipped presoaked and ready to install.

Write for nearest representative, data sheet and literature.

APPLETON WOOD PRODUCTS CO. · APPLETON · WISCONSIN

PHOTOVOLT
pH Meter MOD. 115



A full-fledged line-operated pH Meter of remarkable accuracy at the moderate price of **$175.-**
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Write for bulletin #225 to

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95 MADISON AVE. NEW YORK 16, N. Y.

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PAVING

FLOTATION OILS

INKS

VARNISHES

TALL-OIL

CLOTH

CUTTING OILS

RUST-PROOF COMPOUND

PAINT

SOAP

New uses are popping up everyday for this refugee from the skimmings of kraft mill black liquor. Tall Oil is fast becoming the antidote to a lot of supply shortage headaches and cost problems.

Tall Oil is extracted from black liquor skimmings with the aid of sulphuric acid. Some interesting experiments in connection with the refining of Tall Oil involve the use of sulphuric acid at subzero (centigrade) temperatures. Most applications of sulphuric acid are at room temperature or higher.

Here is a relatively new product, certainly a 'headline' product, and it requires a derivative of Sulphur in the reactions that make it!

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75 East 45th Street, New York 17, N.Y.
811 Rusk Avenue, Houston 2, Texas

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- Spindletop, Texas
- Moss Bluff, Texas
- Fannett, Texas
- Worland, Wyoming
- Okotoks, Alberta, Canada

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	13.00— 13.50
Soft unbleached muslins	15.50— 16.00
Fancy shirt cuttings	4.50— 5.00
No. 1 percales	5.50— 6.00
No. 1 washables	2.25— 2.50
No. 1 light sleslas	6.50— 7.00
No. 1 light prints	4.75— 5.00
Light flannelettes	6.50— 7.00
Cottonades	2.75— 3.25
Blue overall cuttings	6.75— 7.25
Blue cheviots	6.75— 7.25
Canton flannels, bleached	10.50— 11.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	9.50— 10.50
Underwear cuts, bleached	14.50— 15.00
Underwear cuts, unbleached	14.50— 15.00
Sun tan khaki cuttings	5.00— 5.50
American linen cuttings	6.75— 7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.
No. 1 roofing (Chicago)	.65— .75
No. 2 roofing (Chicago)	.55— .65
Twos and blues, repacked	1.50— 1.75
Thirds and blues, repacked	1.50— 1.75
No. 1 whites, repacked	—
No. 1 whites miscellaneous	—
No. 2 whites, repacked	—
No. 2 whites, miscellaneous	—

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt.

Nominal:
- New dark cuttings
- New mixed cuttings
- New light sleslas
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light oxfords
- New light prints

Old Rags

per cwt.

Nominal:
- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light printe
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Dark cottons
- Old shopperies

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	—
Gunny No. 1, foreign	—
No. 1 manila rope, domestic	—
No. 1 manila rope, foreign	—
New burlap cuts (soft)	—
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	90.00— 95.00
No. 1 hard white shavings	75.00— 80.00
No. 1 soft white shavings	50.00— 55.00
Soft white shavings, uncoated	60.00— 65.00
Fly leaf shavings No. 1	30.00— 35.00
Fly leaf, woody, No. 1	25.00— 27.50
Mixed colored shavings	21.00— 23.00
No. 1 books and magazines	24.00— 25.00
Ledger stock, white, No. 1	52.50— 55.00
Ledger stock colored, No. 1 (Midwest ship)	40.00—
New manila envelope cuttings (free of groundwood)	70.00— 75.00
New manila envelope cuttings (containing groundwood)	50.00— 55.00
Manila tab cards	75.00— 80.00
Colored tab cards	55.00— 60.00
New northern kraft envelope cuttings	65.00— 70.00
Triple sorted kraft, 100%	35.00— 37.00
No. 1 old kraft	30.00—
White news cuts, No. 1	60.00— 65.00
No. 1 overissue news	20.00— 22.00
Folded news, special	18.00— 19.00
Folded news, ordinary	16.00— 17.00
Old corrugated boxes	22.00— 23.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	11.00— 13.00
Boxboard cuttings	7.00— 9.00
No. 1 mixed paper	10.00— 12.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt.	5.05—
Powdered, drums, works, cwt.	5.20—
1-Arginine, drums, kilo	90.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	145.00—
L. c. l., ton	155.00—
Bleaching Powder, drums, cwt.	—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	10.00— 12.00
300-mesh bags, c.l., Georgia works, ton	13.50— 14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00— 35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.15—
Glycerine, refined (CP, USP) 99%, drums c. l., delivered lb.	.30⅞—
Litharge, commercial powdered	
Barrels, c. l., works, freight equaled lb.	.14¾—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	10.50—
N	10.85—
WG	11.25—
WW	11.75—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M.	9.65—
N	9.85—
WG	10.05—
WW	10.35—
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be, 1:3.2, turbid, drums, c. l., works, cwt.	1.55—
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.51—
Pearl, 100-lb. bags, cwt.	7.36—
Powdered, 100-lb. paper bags, cwt.	7.48—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	23.50—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09⅛—
High-tinting, drums, c. l., lb.	.14⅛—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15⅛—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—162.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	140.00—
Sulfite screenings	—
Sulfate screenings	—

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

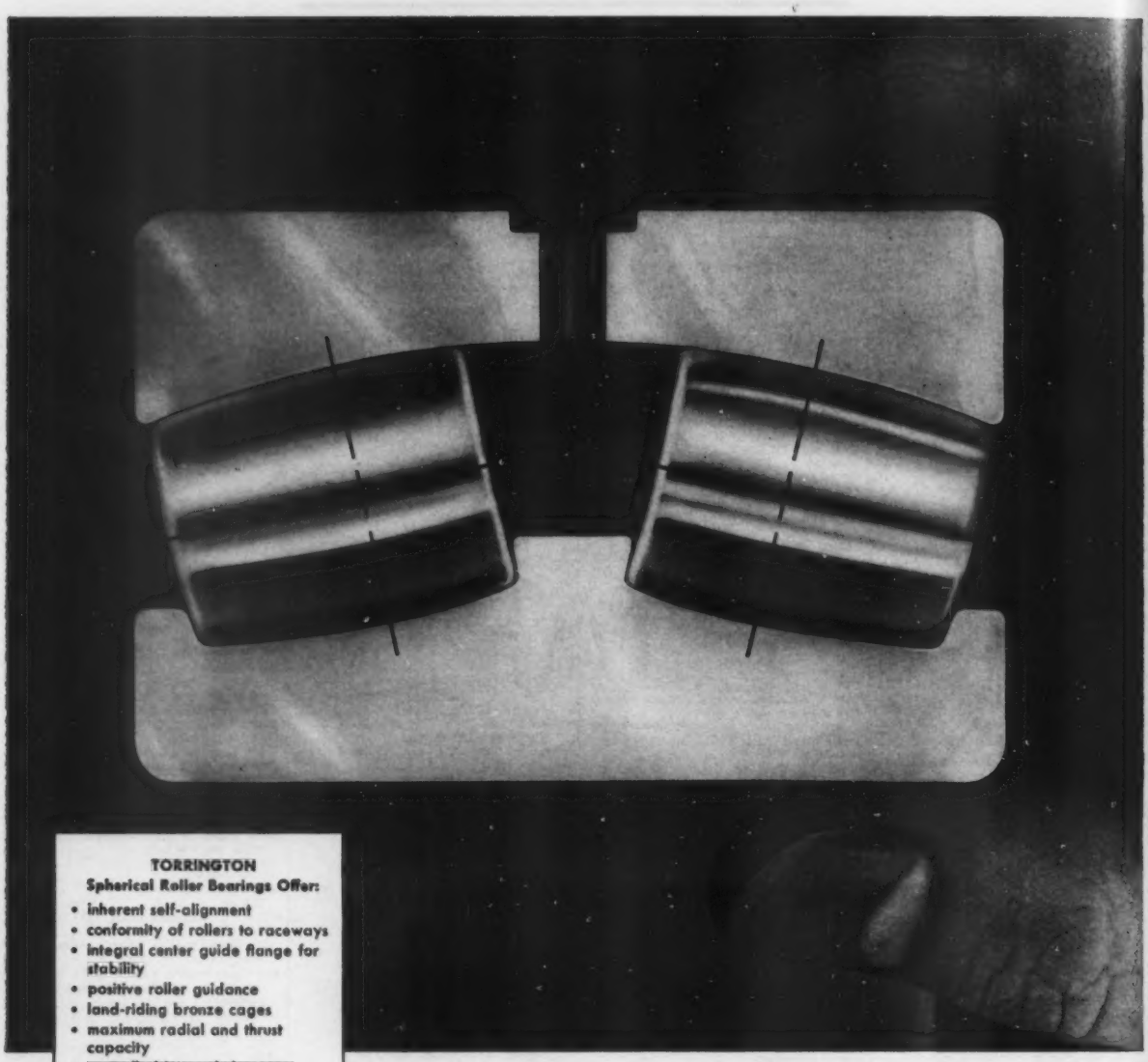
Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50

Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	20.55
No. 2 enamels	19.55
Machine-coated, 45- to 100-lb.	15.55— 19.00
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	22.25
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	21.10
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	—
75% "	—
50% "	—
25% "	—
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	—
75% "	—
50% "	—
25% "	—
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—

Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials

Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt
70-lb. and heavier	8.75
60-lb.	9.00
50-lb.	9.25
40-lb.	9.50
35-lb.	10.00
30-lb.	10.75
25-lb.	11.50
20-lb.	12.50
No. 1 Kraft Butcher — Pink	per cwt
40-lb. only	10.25
(Sheets — Plus 50c cwt)	



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Spherical Roller Bearings Offer:

- inherent self-alignment
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- integral center guide flange for stability
- positive roller guidance
- land-riding bronze cages
- maximum radial and thrust capacity
- controlled internal clearance
- electronically selected rollers
- even load distribution
- long, dependable service life

Send for new Torrington Spherical Roller Bearing Catalog #258.

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The asymmetrical shape of each roller in Torrington Spherical Roller Bearings contributes directly to operating stability and long service life.

The maximum roller diameter is not at the center of the roller. Located towards the center flange, it insures geometric positioning of the roller for positive guidance with free rolling action.

The roller shape also approaches that of a tapered roller. Lines extended from the roller-to-race contact zone converge at the roller and bearing axes. This approach to true conical rolling action further assures stability.

These are two more reasons why Torrington Spherical Roller Bearings operate cooler, quieter and with greater stability. For the ultimate in bearing performance and service life, always specify *Torrington* Spherical Roller Bearings. **The Torrington Company, South Bend 21, Ind.—and Torrington, Conn.**

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Every Basic Type of Anti-friction Bearing

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Index to Advertisers

Acme Steel Company 558
Adell Chemical Company .....
Albany Felt Company 580-581
Allied Chemical Corp., General Chemical Division .....
American Cast Iron Pipe Co. 534
American Cyanamid Co. .....
American Deburator, Inc. .....
Anheuser-Busch, Inc. .....
Antara Chemicals 529
Appleton Wire Works, Inc. ..... 2 o
Appleton Wood Products Co. 605
Arnold, Hoffman & Co., Inc. 591
Asten-Hill Mfg. Co. .....
Atkins Saw Division 601

Barco Manufacturing Co. .....
Beloit Iron Works 575-578
Better Packages, Inc. 593
Bird Machine Company 568
Black-Clawson Company, The .....
Burgess-Manning Company .....

Cameron Machine Co. .....
Carthage Machine Co. .....
Chemical Industries, 27th Exposition of 590
CIBA Company, Inc. .....
Classified Advertising 605
Clinton Corn Processing Co. 532
Conoflow Corporation ..... 4th Cover
Corn Products Sales Co. .....
Curtiss Wright Corporation .....

Darling & Company .....
Dempster Brothers 594
De Zurik Corporation 588
Diamond Power Specialty Corp. .....
Dow Chemical Co. 526, 567
Draper Brothers Company 586
DuBois Co., Inc., The 521
Dusenbery Co., Inc., John .....

Egan & Co., Frank W. .....
English China Clays Sales Corp. .....

Fisher Governor Company 602
Fitchburg Screen Plate Co., Inc. .....
Foote Bros. Gear & Machine Corp. .....
Fritz Publications, Inc. 602

General Dyestuff Company .....

Hanchett Manufacturing Co. 593
Heil Company, The 589
Horton Manufacturing Co., Inc. 586
Hubinger Company, The .....
Humphrey Elevator Company 604
Huyck Felt Co. 564-565

Illinois Gear & Machine Co. .....
Improved Machinery, Inc. 572

Jenkins Sons, Inc., N. W. 596
Johnson Corporation, The 609
Jones Corporation, E. D. ..... 3rd Cover

Kalamazoo Tank & Silo Co. 587
Kamyr, Inc. 530
Kernco Instruments Co., Inc. 590
Kerrigan Iron Works, Inc. 598

Lawson Company, The 533
Layne & Bowler, Inc. 570
Lestoil, Inc. .....
Lindsay Wire Weaving Co., The 519-520
Link-Belt Company 531
Lodding Engineering Corp. 528
Louden Machinery Co., The .....

Marathon, Div. of American Can Co. .....
Moisture Register Co. 601
Mullis Eng. & Mfg. Co., Carl W. 522
Murray Mfg. Co., D. J. .....

Nash Engineering Co., The 571
National Safety Council 603
Naylor Pipe Company 562
Northwest Engineering Company .....
Norton Company .....

Oilgear Company, The 599
Overly's Inc. 595

Paper Industry, The 602
Parsons & Whittemore Inc. .....
Patton Manufacturing Co., Inc., The .....
Penick & Ford, Ltd., Inc. 563
Penobscot Chemical Fibre Co. ..... 2nd Cover
Perkins & Son, Inc., B. F. .....
Photovolt Corporation 605
Planet Corporation .....
Poirier Control Company .....
Pusey & Jones Corp., The .....

Charles P. Raymond Service, Inc. 605
Rogers & Co., Samuel C. 609
Rosenblad Corporation .....
Ross Midwest Fulton Corp. 537

Sandy Hill Iron and Brass Works .....
Scapa Dryers, Inc. .....
Shuler & Benninghofen 583
Signode Steel Strapping Co. 535
Sinclair Company, The 605
Smidth & Co., F. L. 584
Spraying Systems Co. 600
Sprout Waldron & Co., Inc. 527
Staley Mfg. Co., A. E. .....
Standard Oil Co. (Indiana) .....
Stebbins Engineering & Mfgr. Co. 597
Stickle Steam Specialties Co. 592
Swenson Evaporator Company .....

Tennessee Corporation .....
Texas Gulf Sulphur Co. 606
Torrington Company, The 608

Union Asbestos & Rubber Co. .....

Valley Iron Works Company 536
Vanderbilt Co., R. T. 524

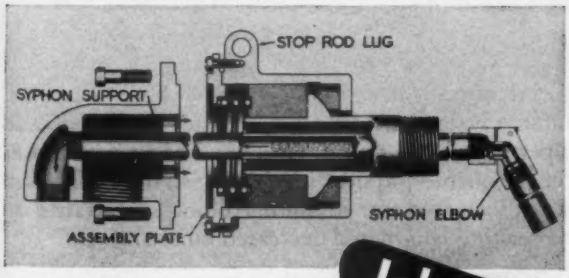
Waldorf Industrial Controls 600
Waterbury Felt Company 595
Weyerhaeuser Timber Co. .....
Whiting Corporation .....
Williams-Gray Company 602
Wisconsin Wire Works .....
Wolferz Alloy Equipment, E. C. .....

Yarnall-Waring Company .....

Professional & Business Service Section
Sirrine Company, J. E. 604

Rotary Joint Headquarters

★ Johnson started the whole idea. Today's *complete* line includes sizes from ¼" to 8" . . . self-supported, pipe-supported, or rod-supported . . . for stationary or rotating syphon pipe . . . all operating speeds and pressures . . . for paper machines, calenders, corrugators, waxers, embossers, roofing machines, printing presses.



Type SDP shown. Hinged syphon elbow replaces unwieldy curved syphon pipes with two straight pipes. Newest Johnson development is the Quick Release nipple. Write for Bulletin S-3001.

Johnson Rotary Pressure Joints

First in the Paper Industry

THE JOHNSON CORPORATION
845 Wood St., Three Rivers, Michigan

ROGERS KNIFE GRINDERS

HEAVY DUTY SERIES 220

Pictured is standard 210" Model 220 equipped with 15 HP Motor and 20" Segmental Grinding Wheel.

Rogers Heavy Duty Model 220 Grinder furnished in sizes from 78" to 240" with mechanical or hydraulic drive. Grinding Heads from 10 HP to 40 HP with segmental grinding wheels from 16" to 30" diam. Rogers Grinders have guaranteed built-in accuracy to produce the best grinding results. Many models and sizes from which to choose. Write for complete information.

SINCE 1887

SAMUEL C. ROGERS & CO., INC.
2070 SHERIDAN DRIVE • BUFFALO 23, NEW YORK

PAPER INDUSTRY

Whither?

... in production, processes, new products, markets

Airborne pulp dryer

A new concept of paper and pulp drying has been introduced by the Flakt airborne dryer installed at Bowaters' Catawba mill. In this dryer high-velocity air is used for both drying and sheet conveying purposes. The sheet makes 17 passes through the dryer at velocities of 45 to 95 fpm. Steam consumption is 1.1 lb. per pound of water evaporated, while electric power requirements are 900 KW to operate the 120 air-circulating fans. The dryer has been operated at rates of 250 to 500 A.D. tons per day.

Consistorator — a new consistency regulator

The "Consistorator", a recent development of Fischer-Porter Company, consists basically of a pipeline tee with a raised discharge leg, a specially designed shear float which is the sensing unit, and a transmitter which transmits a 3 to 15 psi pneumatic signal which is proportional to the force on the shear float.

The principle of its operation is based on the deformation of the stock stream as it pushes past the float pegs, thereby creating a shear-force which is a function of the consistency of the stock.

The unit has been thoroughly evaluated on sulfite pulps and found to operate satisfactorily over a range of consistencies of 2.2 to 4.4 per cent with a standard deviation of plus or minus 0.30 per cent.

Cost of nuclear vs. conventional fuels

The average cost for commercial fuels paid by paper mills in 1956 amounted to 32 cents per 10,000,000 Btu., with variations shown by individual mills, depending on location, etc., from 16 cents to 70 cents per 10,000,000 Btu.

A 50 Mwt. nuclear plant, according to J. W. Magee of Westinghouse, would cost $60 to $80 per Kwt., which would make it economically competitive with a conventional plant paying 57 to 69 cents per 10,000,000 Btu.

Effects of surfactants on drainage and strength of sulfite pulps

In an investigation conducted at the University of Maine with surfactants, it was found that they facilitated water removal from the sheets and they also affected the physical properties of the pulps. Cationic surfactants, it was found, had the greatest effect on the physical properties — they decreased breaking length and burst but increased tear strength. Anionic surfactants, on the other hand, increased breaking length and decreased burst and tear.

Titanium in the pulp and paper industry

Tests conducted at Battelle Memorial Institute have shown that titanium, with its outstanding corrosion-resistant properties, can find many useful and economical applications in the pulp and paper industry.

It is ideal for handling chlorine dioxide, wet chlorine gas and other bleaching agents. It also has excellent resistance to strong alkaline, neutral sulfite and ammonia-base acid sulfite liquors. Another potential field is its use in fourdrinier wires.

For more efficient waste paper pulping

Take a look at Turboflex

Efficient Turboflex impeller has high inner vanes that produce maximum circulation and steady vortex action, low outer vanes that provide high speed pulping action. Directional vanes on sides give controlled flow effect that helps initial breaking.

Proven in Canada by Fleck – Now built in the U.S. by Jones

With more than two decades of experience in Canadian and European mills the Fleck Turboflex pulper has earned recognition as the finest equipment of its kind available anywhere. To provide American mills with the same top efficiency in waste paper pulping, Turboflex units of all sizes are now also being built in the U.S. by Jones.

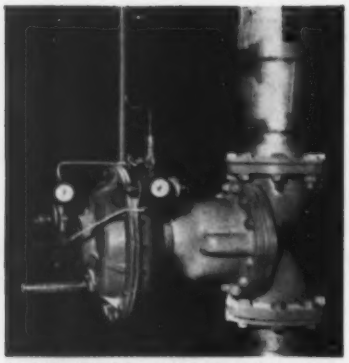
Some of the features you will prefer in Turboflex include: *curved tops* to prevent serious splashing; *specially designed impellers* for more effective defiberizing; *disc type dump valves*, instead of slide, for faster discharge; *replaceable wearing* parts for faster, lower cost maintenance.

For complete details on Turboflex write to E. D. Jones Corporation, Pittsfield, Mass.

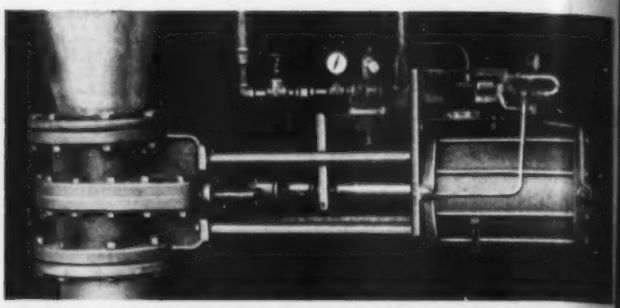
E. D. JONES CORP. member BELOIT group PITTSFIELD, MASS.

Jones

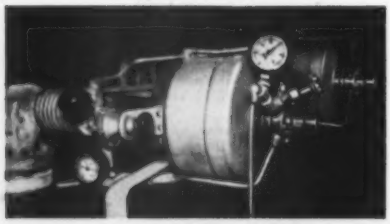
PULP MILL EQUIPMENT AND STOCK PREPARATION MACHINERY



SAUNDERS VALVE (Conoflow close-coupled type) affords automatic throttling control of white water in bleach plant at Marathon Southern's Naheola, Alabama mill. Conoflow is the world's largest producer of Saunders valves for automatic control.



PULP STOCK VALVE (8" Walworth with Conoflow actuator) on automatic control service at Crossett Paper Mills, Crossett, Arkansas. Conoflow actuated pulp stock valves are available in all sizes.



CONTROL VALVES (Conoflow Series LB) on a tough service at the R-W Paper Company plant in Longview, Washington. These 2" single-seated angle valves are handling steam at 700°F. and 600 psi with a 580 lb. pressure drop.

PRESSURE TRANSMITTERS (Conoflow Model P) measuring pressure of pulp stock during bleaching process at the P. H. Glatfelter paper plant in Spring Grove, Pa. This is one of several Conoflow Model P's measuring pressure and liquid level at this mill.

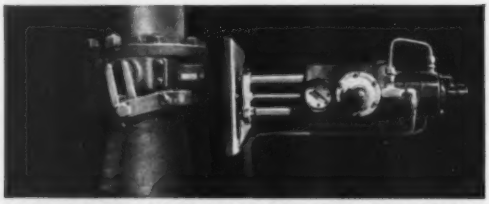
CONOFLOW

CONTROLLED FLOW

AUTOMATION IN PAPER MAKING

The installations shown here are typical of how Conoflow final control elements have helped bring automation to the pulp and paper industry. Conoflow products make possible faster, more efficient operations, and substantial savings of costly process fluids for many modern paper mills.

VALUABLE DATA FREE! To find out where automatic process control can help you, write for Bulletin MD-1 *Application of Conoflow Equipment in Modern Pulp and Paper Making Processes.* Also ask for reprint *How to Use Standard Pulp Valves for Throttling Control*—a thought-provoking and informative article. Both will be mailed to you promptly, without obligation. Dept. C-901, Conoflow Corporation, 2100 Arch Street, Philadelphia 3, Pa. Conoflow engineering representatives are located in principal cities throughout the world.



BUTTERFLY VALVE (Conoflow actuated) on automatic control service at Crossett Paper Mills, Crossett, Arkansas.

CURRENT CONTROLLERS (Conoflow Model EB) regulating speed of washer thickeners in bleach plant at Marathon Southern mill in Naheola, Alabama. The Model EB is a unique pneumatic-electric transducer—a Conoflow exclusive for the paper industry.

CONOFLOW CORPORATION

FOREMOST IN FINAL CONTROL ELEMENTS

SUBSIDIARY WALWORTH